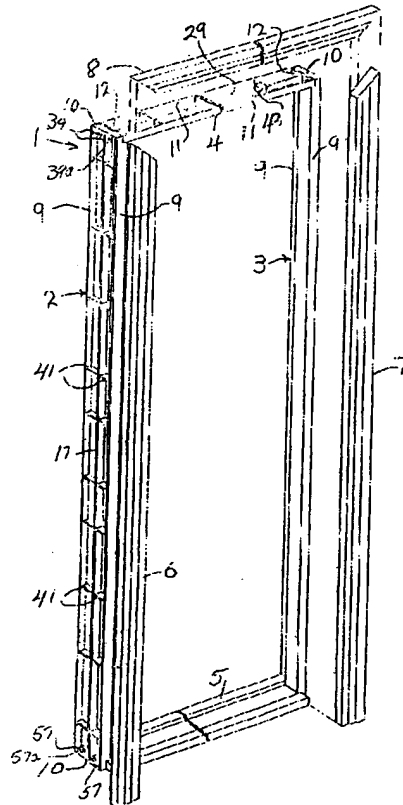


(72) DE ZEN, Vic, CA
(71) ROYAL GROUP TECHNOLOGIES LIMITED, CA
(51) Int.Cl.⁶ E06B 1/26, E06B 1/70
(54) **BATI DE PORTE COMPOSITE**
(54) **COMPOSITE DOOR FRAMES**



(57) La présente invention vise un bâti de montage pour portes et éléments similaires, constitué de deux montants, d'une traverse supérieure servant à relier les montants et, au besoin, d'un seuil. Ces éléments sont faits de matériaux de remplissage, de matériaux de rebut ou de matériaux particuliers recyclés, liés entre eux au moyen d'un agent de liaisonnement thermoplastique. Une fois assemblés, les montants et la traverse présentent une surface plane du côté intérieur et constituent une baie d'une largeur permettant de recevoir la porte à y être montée, avec battée en saillie du côté intérieur. La présente invention vise également les éléments de conception nouvelle constituant un tel bâti, c'est-à-dire les montants, la traverse et le seuil.

(57) A frame assembly for mounting doors and the like comprising a pair of jambs and a header for connecting said jambs, and, where required, a sill, each said jambs and header and sill where required being a compression molding of filler, waste, or recycled particulate material bound together by a thermoplastic binder, each said jambs and header presenting when assembled an inwardly facing planar surface of a width to receive a door to be mounted in said frame assembly and an inwardly projecting door stop shoulder formation projecting inwardly of said planar surface. Also the novel components for such a frame assembly comprising the jambs, the header and the sill.

COMPOSITE DOOR FRAMES

5 FIELD OF THE INVENTION

This invention relates to frames for doors and to the frame members from which said frames are assembled.

10

BACKGROUND OF THE INVENTION

At present, the majority of door frames are made of wood and include a pair of jamb members and a header. If it is an outside door, the door
15 frame also includes a door sill while in the case of inside doors the jambs extend to the floor.

Where large volumes are involved, the door frame members can be manufactured at a factory ready to be assembled on the job site or, in some
20 instances, at the factory. Frequently, however, the door frame members are cut from lumber on the job site and drilled and routed out to provide for keepers and hinge mounting areas and then fitted into position for each individual door.

25 In addition to wood, there are door frames of other material or of other material along with wood.

U.S. Patent 1,606,780, issued November 16th, 1926, discloses a metal door frame.

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U.S. Patent 4,281,481, issued August 4th, 1981, discloses an aluminum door frame while U.S. Patent 3,287,856, issued October 16th, 1964, discloses an extruded metal frame.

- 2 -

U.S. Patent 4,531,337, issued July 30th, 1985, discloses a combination metal and wood door frame while U.S. Patent 4,505,080, issued March 19th, 1985, discloses a combination door frame of extruded metal or plastic and wood while U.S. Patent 5,293,723, issued March 15th, 1994,
5 discloses a combination of plastic and wood door frame.

In the case of wood door frames not only is wood relatively expensive but the wood members from which the frame is made are subject to twisting and warping adversely affecting the accuracy of the frame.
10

The metal frames on the other hand do not lend themselves to adjustment in the field to meet the circumstances of the frame receiving openings in the wall. Moreover, they are expensive and also usually involve assembly with some wood. Moreover, the metal is a good conductor of heat
15 and is therefore a poor insulator.

Extruded plastic frame members do not have the inherent strength or wood and are not readily secured without the use of wood inserts.

20

SUMMARY OF THE INVENTION

The present invention is directed to providing a door frame which is very much cheaper than existing door frames, exhibits all the advantages of
25 solid wood frames for workability and insulation but which is stronger, impervious to the elements and insects and will not splinter, crack, warp, corrode or rust, nor require the maintenance involved with wood frames.

According to the invention, the door frame is formed from
30 components of compression molded composite material molded into accurate profiles ready for quick, easy and accurate assembly.

More particularly, according to the invention the frame components are compression moldings of filler, waste, or recycled particles or small pieces

- 3 -

(hereinafter "particulate material") bonded together by a thermoplastic material which can be a waste or recycled thermoplastic.

5 Such compression molded components according to the preferred form of the invention are formed to provide interengaging locating means to ensure that they are brought together in precisely accurate registration ready for securement by appropriate fasteners.

10 In this connection, by providing for precise component assembly interengagement a minimum number of fasteners is required to secure the frame members in assembled relation enabling the door frame to be quickly, easily and accurately assembled.

15 Being molded, the invention enables the jamb and header frame members to be formed as elongated channels or boxes suitably internally reinforced which present stepped bottom surfaces to be presented facing inwardly of the door receiving opening to be framed by the door frame. Such in effect hollowed outdoor frame members thus require a minimum of material creating members of light weight for ease of handling and installation.

20 Further, by compression molding the frame members, they can be formed to provide integral bored pods, protuberances or thickened areas to receive, support and accommodate the passage of screws or the like therethrough to secure the frame members to the door frame opening.

25 Moreover, by forming the door frame elements in the molding or other operation provision can be made to accurately locate the hinge and striker plate mounting areas and to provide appropriately located internal reinforcing hollowed out pods or blocks of material to accept the insertion of
30 the latching and bolting hardware of a door.

Also, according to the invention, the jambs and header members can be molded to produce a precisely accurate integral molding to meet the brick

work (sometimes refined to a brick molding) when the door frame is for an outside door.

Where it is desired to employ a separate brick molding according to the invention, there is provided an elongated compression molded channel member with bevelled ends and transverse webs including webs running angularly or obliquely across between the walls of the channel and webs running perpendicularly across between the channel walls whereby the molding may be cut at appropriate locations to form bevelled ended header moldings of varying length depending on the door width and jamb moldings having bevelled upper ends either for a left hand or right hand door jamb.

Further according to the invention, the door frame sill where required is formed as a molded composite structure with a repeating internal pattern so that it can be cut at appropriate points to fit the width of door which the door frame is to receive.

These and other features of the invention will be apparent from the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view illustrating a molded door frame for an in swing door with a separate trim or brick molding in accordance with the invention.

Figure 2 is an enlarged perspective view illustrating the connection of the top of one of the jambs of the frame of Figure 1 with the header.

Figure 3 is a perspective view illustrating how the bottom of one of the jambs is connected to the sill and showing the jamb of the trim or brick molding in position to be connected to the jamb of the frame.

Figure 4 is a view similar to Figure 3 but showing an out swing door.

5 Figure 5 is a vertical section through the door frame with the separate trim or brick molding attached.

 Figure 6 is a perspective view of a molded sill in accordance with the invention which can be cut to suit different frame sizes to accommodate
10 different widths of doors.

 Figure 7 is a perspective view of an elongated molded structure from which the jambs and headers of the separate trim or brick molding for the door frame can be formed.
15

 Figure 7a is an elevational view looking into the bottom molding of Figure 7 which has been placed on its side.

 Figure 8 is a perspective view of one of the jambs of the door frame
20 showing how it is attached to the door receiving opening in a building wall.

 Figure 9 is a horizontal sectional detail of the jamb and wall structure of Figure 8 showing a door in place displacing the resilient flexible weather strip used to hide the attachment screws when the door is open, one
25 screw only being illustrated.

 Figure 10 is a view similar to Figure 9 but with the door open showing the resilient flexible weather stripping now covering and hiding the attachment screw.
30

 Figure 11 is a perspective view of a section of the door jamb to which the door is to be hinged and showing one of the hinge receiving recesses.

- 6 -

Figure 12 is a perspective view taken from the rear of the jamb shown in Figure 11 showing the arrangement of integral pods or protuberances formed with through passages or bores to receive the screws for attachment of the hinge to the door jamb.

5

Figure 13 is a perspective view of the jamb which is to receive the striker plate for the door and which incorporates the door latch and locking bolt recesses.

10

Figure 14 is a perspective view of the jamb of Figure 13 taken from the rear showing the molded reinforcing material blocks or pods for acceptance of the door latching mechanism and locking bolt.

15

Figure 15 is a front elevational view of a door frame in accordance with the invention in which the trim or brick molding is molded integrally with the door frame jambs and header.

20

Figure 16 is a perspective view of the door frame of Figure 15 ready to be inserted into the door receiving opening of a wall.

Figure 17 is a perspective view illustrating the assembly of the header with the integral trim or brick molding with the tops of the jambs which have the integral trim or brick molding.

25

Figure 18 is an enlarged perspective view illustrating the connection between one of the jambs illustrated in Figure 17 and one end of the mating header.

30

Figure 19 is a perspective view illustrating the manner of connecting the bottom of the left hand jamb to the sill for an in swing door.

Figure 20 illustrates the right hand jamb about to be attached to the other end of the sill.

Figure 21 is a horizontal sectional view showing the door frame with its integral trim or brick molding mounted in the door receiving opening with a door in the closed position.

5 Figure 22 is a vertical sectional view of the door frame assembly of Figure 21.

Figure 23 is a perspective view illustrating a door frame and a side light frame ready for attachment with a separate trim or brick molding.

10

Figure 24 is an elevational view showing the door frame and separate side light frame assembled with the peripheral molding attached.

15 DETAILED DESCRIPTION ACCORDING TO THE PREFERRED
 EMBODIMENTS OF THE PRESENT INVENTION

With reference to Figure 1, there is shown a door frame generally designated at 1 comprising a left hand jamb 2, a right hand jamb 3, a header 4, and a sill 5.

20

Also in Figure 1 there is shown a separate trim or brick molding for attachment to the frame 1 comprising a left hand molding jamb 6, a right hand molding jamb 7, and a molding header 8.

25

Each of the door frame jambs 2 and 3, header 4, and sill 5 are formed of synthetic material comprising compression moldings of filler, waste, or recycled particulate material bonded together by a thermoplastic binder which advantageously is a waste or a recycled thermoplastic. Similarly, each of the molding members 6, 7 and 8 are also compression moldings of similar synthetic material.

30

- 8 -

The particulate material to be used in the door frame members is selected to provide the requisite properties such as temperature stability, strength, and hardness.

5 Where the door frame is to be exposed to substantial temperature changes, the particulate filler, waste, or recycled material preferably comprises at least in part a fibrous material such as wood flour, saw dust, shredded and/or ground waste cloth or paper. The thermoplastic binding material may
10 comprise, for example, recycled PVC or polyethylene and the ratio by weight would preferably be about 30% to about 60% to 70% particulate material with the balance being the thermoplastic binder material, or principally thermoplastic binder material together, if desired, with some additional
15 particulate material such as fly ash or kiln dust to impart hardness and strength. For example, as quantities of sawdust are usually readily available, a particularly usual composite material for external door frames exposed to wide temperature ranges comprises approximately 50% sawdust and 50% recycled polyethylene. It will be understood, however, that the percentage and nature of the filler, waste or recycled particulate material and the thermoplastic material can vary widely depending on the door frame requirements and there
20 may be certain instances where the ratio of particulate material to thermoplastic material can be as high as 90% to 10% and vice versa.

 With respect to the thermoplastic material, the recycled polyethylene may be reground low, medium or high density polyethylene.
25 Other examples of useful recycled thermoplastics comprise reground polypropylene, polyethylene terephthalate (PET), nylon, and ABS.

 Other examples of filler waste or recycled particulate materials to be bonded together by the thermoplastic binder can include, for example,
30 without limiting the same, glass fibers or particles, reground thermosetting materials, ground shells such as peanut shells and husks such as rice and corn husks, ground particles of rubber or metal or other hard material.

In molding the door frame components, preferably the particulate filler waste or recycled material and the recycled plastic material are introduced into the compression mold as an intimate mixture of hot particulate material having its particles coated with molten thermoplastic material
5 whereupon under compression forces in the compression molding operation the molten thermoplastic material encapsulates and bonds the coated particles into a strong compacted bonded mat.

Each of the jambs 2 and 3 and the header 4 are molded to form an
10 elongated box like structure. The jambs have elongated side walls 9 and end walls 10 with the header 4 having elongated side walls 11 and end walls 12.

Standard doors are 79 inches tall and come in widths typically
varying from 30 inches to 42 inches with the majority of doors being either 32
15 or 36 inches in width. However, it will be understood that the door heights may vary, some doors being for example 96 inches tall, and the width of double doors will of course be substantially greater than 42 inches.

As a result, it will be appreciated that the jambs 2 and 3 have to
20 have a length to accommodate the height of the doors while the length of the header will vary to accommodate the different widths of doors.

As shown in Figures 2, 3 and 4, the box like structures of each of
the jambs 2 and 3 is formed with a stepped bottom to be presented facing
25 inwardly of a door receiving opening to be framed by the door frame and comprising a first step 13 presenting a first longitudinally extending exterior bottom planar surface 13a of a width to receive the thickness of the edge of a door such as the door 14 shown in Figure 5 to be mounted in the frame.

30 Extending along side of the first step 13 and projecting inwardly beyond its planar surface 13a is a second step 15 presenting a second longitudinal extending planar bottom surface 15a. The juncture between steps 13 and 15 defines a door stop shoulder 16.

- 10 -

The interior of each of said jambs 2 and 3 is divided intermediate its width in line with the juncture of the first and second steps 13 and 15 by a longitudinally extending wall 17 which in effect divides the interior of the jambs into two adjoining channels 17a and 17b with channel 17a being shallower than channel 17b. The edge 18 of wall 17 terminates in the same plane as the edges 19 of the walls 9 and 10 of the jambs. The arrangement is such that when mounting the jambs 2 or 3 in the wall opening of the building as illustrated in Figure 4 the edges 18 and 19 will abut the framing of the building wall opening constituted for example by the two by four 20 and wall sheeting or partitions 21.

The stepped bottom of each of the jambs 2 and 3 is formed with a groove 22 at the juncture of the steps 13 and 15 with this groove 22 extending into the longitudinally extending wall 17 and being adapted for the mounting therein of resiliently flexible weatherstripping 23 for a purpose as will hereinafter be more fully described.

The inwardly projecting second step 15 of the jambs is shown as terminating short of the jamb end walls 10. As illustrated particularly in Figure 2, the upper end of step 15 terminates in a flat ledge 24 which is adapted to form a locating seat for the header 4 as hereinafter more fully described.

Similarly, the lower end of the step 15 ends short of the lower end of the jamb in a slightly inclined ledge 25 adapted to seat on the sill 5 as hereinafter more fully described.

As shown in Figure 5, the molded header 4, like the jambs 2 and 3, preferably has a stepped bottom surface which, when the header is installed, faces inwardly of the door frame opening said stepped header bottom comprising a first step 26 presenting longitudinally extending planar exterior bottom surface 26a of a width to receive the edge of a door to be mounted in the door frame and a second step 27 presenting longitudinally extending planar exterior bottom surface 27a said step 27 projecting inwardly beyond the surface 26a to provide a door stop shoulder 28 as shown in Figure 5.

- 11 -

5 A longitudinal wall 29 registering with the juncture of the steps 26 and 27 divides the interior of the header intermediate its width into a pair of adjoining channels 30 and 31 with the channel 30 being shallower than the channel 31.

10 It will be understood that the edge 32 of the wall 29 will be in the same plane as the edges 33 of the walls 11 and 12 of the header for mounting in the door frame receiving opening of the wall in which the door frame and door is to be mounted as illustrated in Figure 4.

15 In the arrangement shown, particularly in Figure 2, the length of the header steps 26 and 27 and the header channels 30 and 31 are the same so that the end wall 12 at each end of the header will contact the face area 34 of the respective jamb above the jamb ledge 24 with the bottom surface 27a of the header step 27 resting on the ledge 24.

20 As illustrated in Figure 2, the end wall 12 of the header is provided with spaced generally semi-circular notches 35 while the jamb 3 is shown with integral pegs or protuberances 36 which fit into the notches 35 to ensure proper registered assembly between the header and the jamb with the header seated on the jamb ledge 24.

25 The interior of the header end wall 12 is provided with integral protuberances 37 to provide a body of material having a depth to receive and provide adequate holding power for the screws 38 which pass through the jamb and into the end of the header and into the protuberances 37 in the assembly of the header with the jamb.

30 The header can be cut transversely to fit different widths of doors or for use in side light frames as hereinafter explained by providing, as shown in Figure 2, one or more internal transverse walls 12' provided with notches 35' corresponding to the notches 35 and with protuberances 37' corresponding to the notches 37.

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- 12 -

It will be understood that the arrangement at one end of the header as illustrated in Figure 2 will be duplicated at the other end in assembling the header to the jambs.

5 As shown in Figure 1, the interior of the jamb 2 is provided with internal integral protuberances 39 extending out from the inner surface of the bottom wall to provide support for the screws 38 for the assembly of the jamb and header. Preferably these protuberances 39 are formed with passages or
10 bores 39a extending therethrough, these bores being shown as emerging from the wall portion 40 above the ledges 24 of the right hand jamb 3 in Figure 2, it being understood that the left and right hand jambs are identical with respect to the arrangement for registration and securement with the header.

 The jambs 2 and 3 are preferably provided with transverse
15 reinforcing webs 41 running between the longitudinal intermediate wall 17 and the side walls 9 of the jambs.

 Similar webs 42 are provided in the header 4 running between the intermediate longitudinal header wall 29 and the header side walls 11.
20

 As in the case of the jambs, the stepped bottom surface of the header 4 is provided with a groove 43 at the juncture of the steps 26 and 27 with this groove extending up into the intermediate wall 29 for the mounting of resilient flexible weather stripping 23.
25

 By providing bores through the protuberances 39 with a diameter such that they snugly fit the screws 38, the jambs can be secured to the header without the turning of the screws backing off the jambs from the ends of the header.
30

 The sill 5 shown in Figures 3, 4, 5 and particularly Figure 6 like the jambs 2 and 3 and the header 4 is formed by compression molding a composite material comprising filler, waste or recycled particulate material and a thermoplastic binder as set out above.

- 13 -

As shown in Figure 6, the sill is preferably formed as an elongated member to cover the full range of door widths or sizes, being adapted to be cut at various points corresponding to the width of the door the door frame is intended to receive.

As shown in Figure 6, in its elongated form, the top of the sill comprises a narrow horizontal portion 44 running the length of the sill and a wider sloping portion 45 separated by a longitudinal groove 46.

Spanning between end walls 47 and 47a of the sill are outer walls or legs 48 and 49 and intermediate legs 50 and 51 all of which legs terminate in a common plane with the bottom edges 52 of the end walls 47 and 47a.

The end walls 47 and 47a are provided with notches 53 to receive correspondingly shaped pegs or projections 54 provided at the bottom of the jambs 2 and 3 as illustrated in Figure 3.

On the inside of the end walls 47 and 47a of the sill, there are provided integral inwardly projecting protuberances 55 to provide a depth of material to be engaged by and provide holding power for fasteners or screws 56 used to assemble the jambs to the sill as illustrated in Figure 3.

By the provision of the projections 54 on the jambs and the notches 53 in the sill end walls 47 and 47a, proper registration can be obtained between the jambs and the sill prior to securing the members together.

The jambs 2 and 3 are also provided with interior projections 57 as indicated in Figure 1 to provide support for the fasteners 56 and again these projections are formed with bores 57a to snugly receive the fasteners 56 so that when screws are used the turning of the screws will not back off the lower end of the jambs as the screws penetrate the material of the sill projections 55.

- 14 -

As illustrated in Figure 6, the end walls 47 and 47a are in essence duplicated at points along the length of the sill member shown in Figure 6 to provide for the sills of different widths of doors or a sill for a door with a side light as hereinafter more fully explained. Thus by cutting the sill of Figure 6 at the outside of the walls 58a, 58b, and 58c end walls 47₁, 47₂, and 47₃ will be provided complete with notches 53 and projections 55.

Similarly, if the elongated sill of Figure 6 is cut at the outside of walls 59a and 59b, the right hand end wall 47a will be duplicated as end walls 47a₁ and 47a₂ complete with notches 53 and projections 55.

When installed, the sill 5 preferably has its wider sloping surface 45 covered with an aluminum extrusion 60 and its top horizontal surface 44 covered with a vinyl extrusion 61 arranged to interengage in the longitudinal groove 46.

An additional protective aluminum extrusion 62 is arranged to interlock with either the aluminum extrusion 60 in an in swinging door or the vinyl extrusion 61 in an out swinging door.

In assembling the door jambs 2 and 3 to the ends of the header 4, only two screws for each jamb is required these screws passing through the bored jamb protuberances 39 and into the header protuberance 37. Similarly, only two screws for each jamb is required to secure the jamb to sill 5, the screws passing through the bored jamb projections or protuberances 57 and into the sill protuberances 55. Thus the entire door frame can be assembled with only eight screws.

With respect to the fastening of the jambs 2 and 3 of the assembled door frame, to the opening in the wall to receive the door frame, reference is had to Figures 8, 9 and 10. As illustrated in Figure 8, the inwardly facing planar bottom surface 13a of the jamb step 13 is recessed as at 63 at intervals along its length. As shown in Figures 9 and 10, the interior of the jamb behind the recessed area 63 has a solid column of material 64 extending the depth of

- 15 -

the step 13 and this solid column 64 is formed with a bore 65 extending therethrough of a diameter to snugly receive the fasteners or screws 66 so that when the jamb is mounted against the door frame receiving opening frame member 20 then the turning of the screw 66 to penetrate the frame member 20 to clamp the jamb to the frame member will not act to back off the jamb.

Figure 9 illustrates the mounted jamb with the door 14 in the closed position compressing the flexible resilient weather stripping 23 which clears the head of the screw 66 which is seated down in the recess 63. However, the head of the screw will not be visible with the door 4 in the closed position.

Figure 10 is a view similar to Figure 9 but without the door 14 present and showing the flexible resilient weather stripping recovered to extend over the screw 66 hiding same from view with the door open.

15

It will be understood that in mounting the door 14 the door will be hinged to one of the jambs 2 or 3 and the other jamb will accommodate the striker plate door latch and door bolt where required.

Figures 11 and 12 illustrate, as an example, jamb 3 to which the door is to be hinged.

As shown in Figure 11, the inwardly facing first bottom planar surface 13a of a step 13 is recessed as at 68 for flush mounting of one leaf of the hinge 69 shown in Figure 12.

25

On the reverse side of the jamb behind the recessed area 68, the interior of the jamb is formed with a series of integral interconnected columns or projections 70 extending the depth of the step 13 to provide a body of material to receive the hinge screws or fasteners 71.

30

The planar surface 13a of the opposite jamb, i.e. jamb 2, is shown in Figure 13 as being recessed at 72 to receive a striker plate, not shown, and also recessed as at 73 to receive a bolt plate, not shown.

- 16 -

Behind the striker plate recess 72 in the interior of the step 13 is an integral block of material 74 extending the depth of the step 13. The striker plate recess 72 is formed with a rectangular bore 75 projecting into the block
5 74 to provide an opening for the door latch.

Similarly, behind the bolt recess 73 is a block of material 74' with the bolt recessed area 73 being provided with a rectangular bore 76 extending through the integral block of material 74' to receive a latching bolt.
10

It will be understood that when viewing the in swing door of Figure 1 from the outside of a building it will be the right hand jamb 3 which will be formed to receive the hinges, usually three hinges being employed. The left hand jamb will be formed to accommodate the door latch and door bolt where
15 employed. However, it will be understood that the swinging of the door can be reversed in which case the left hand jamb will receive the hinges and the right hand jamb the door latch and bolt.

The role of these jambs will be reversed in the case of an out swing
20 door.

To dress the door frame 1 of Figure 1 the molding comprising the molding jambs 6 and 7 and the header 8 is provided. As mentioned, this molding is formed as a compression molding of composite material as
25 described above. Since the molding members 6, 7 and 8 do not carry the load of the door, it will be understood that the nature of the particulate material and the percentage of particulate material and thermoplastic material may vary from that employed in molding the door frame itself.

30 These molding members 6, 7 and 8 may of course be individually molded or they can be conveniently obtained by appropriately cutting the elongated molding channel 79 shown in Figure 7. This channel 79 is formed with beveled ends 80, a series of slanted internal webs 81, and right angular webs 82 extending between the side walls 83 of the channel. By cutting

- 17 -

along the appropriate lines 84 coinciding with the slanted internal webs 81, the proper length of header 8 can be obtained to suit the door frame size required for the size of door selected or, if a door side light is used, the length necessary to frame the head of the door and door side light. It will be understood that the cutting will take place so that both ends of the header are beveled.

By cutting the molding 79 transversely at right angles to the said walls 83, the door jambs 6 and 7 can be formed.

When the header 8 and jambs 6 and 7 are attached to the frame 1 as by finishing nails for example, these frame members will form mitered top corners.

While preferably the jambs 2 and 3 are formed so that the door stop shoulders 16 presented by the second steps 15 are shorter than the door edge receiving surfaces 13a presented by the first steps 13 to provide mounting ledges 24 as shown in Figure 2 and the door stop shoulder 28 presented by the second step 27 of the header 4 extends the full length of the header, this relationship may be reversed if desired. That is, the header second step 27 and hence door stop shoulder 28 can be formed to terminate short of both ends of the first step 26 of the header while the jamb stop shoulders 16 can continue to the tops of the jambs.

It will be understood in the case of inside doors where sills are not required, the jambs will extend down to rest on the floor.

Figures 15 to 18 illustrate a door frame generally designated at 85 which has jambs 86 and 87 and a header 88 which are identical with jambs 2, 3 and header 4 except that they have the moldings corresponding to the jamb molding 6 and 7 and the header molding 8 molded integral therewith. Because in all other respects the jambs 86 and 87 and the header 88 correspond to the jambs 2 and 3 and the header 4 like parts are given like numbers. The sill 5 remains unchanged.

- 18 -

Figure 15 shows the door frame 85 with the jambs with their integral moldings 89, the header with its integral molding 90 and the sill 5 assembled ready for introduction into the frame receiving opening of a wall.

- 5 Figure 16 illustrates the assembled door frame 85 about to be mounted in the wall opening to be attached to the receiving frame members 20 which may for instance be two by fours.

- 10 As shown in Figures 17 and 18 and particularly in Figure 22, the integral header molding 90 in the case of an in swing door, which represents the major portion of the market, extends outwardly from the header side wall 11 at a point spaced above the planar header wall 15 as shown in Figure 22. The header molding 90 is, in effect, an elongated L-shaped section having a short leg portion 91 extending outwardly perpendicular to the header wall 11 at a point retracted from the planar surface 27a and a longer leg portion 92
15 extending at right angles thereto which forms the front wall of the header molding projecting outwardly of the opening defined by the door frame as shown in Figure 22.

- 20 As shown in Figures 17 and 18, the ends of the header molding 90 are closed with a sloping wall 93 and a short return wall 94 to provide bevelled mounting surfaces for engagement with the jamb moldings 89 to provide mitered corners when the header 88 is assembled with the jambs 86 and 87 as described below.

- 25 As shown particularly in Figure 21, as in the case of the header molding 90, each of the jamb moldings 89 is an elongated generally L-shaped formation having a short leg 95 projecting outwardly at right angles from the wall 9 of the jambs at a point retracted from the jamb planar surfaces 15a and a longer leg portion 96 projecting outwardly from the opening defined by the door frame.
30

Figure 21 illustrates the function of the integral jamb moldings 89 which not only provide a trim appearance to the door frame but extend to

- 19 -

meet with the brick work indicated at 97 (and hence termed brick moldings) to which they are sealed by caulking 98 to provide an air space 99 between the building wall structure constituted by the two by fours 20 and wall partitions 21 to provide an insulating effect.

5

It will be understood that a similar function will be formed by the header molding 90.

As shown in Figures 17 and 18, the upper ends of the jamb moldings 89 are closed by a sloping wall 100 and a short return wall 101. The bottoms of the jamb moldings 89 are provided with intumed feet 102 as shown in Figure 19.

The assembly of the jambs 86 and 87 with their integrally molded moldings 89 with the sill 5 is identical to that as described in connection with the jambs 2 and 3 and the sill 5 as illustrated in Figures 19 and 20,

In many instances, the installation of a door frame may call for the provision of a side light at one side or even a side light at both sides. Figures 23 and 24 illustrate an installation involving a side light frame generally designated at 103 to be attached to the frame 1. It will be understood that this side light frame 103 is adapted to receive a conventional dual pane window unit (not shown) which has a thickness corresponding to the thickness of a door in the same manner that frame 1 is adapted to receive a door. The side light frame 103 is formed of jambs 104, header 105, and sill 106 which correspond to jambs 2 and 3 and to the header 4 and sill 5 respectively except that the jambs do not have provisions for the mounting of the hinges and reception of the door hardware and the internal pods involved with such hardware but as will be understood have appropriate internal pods (not shown) for assembling with the frame 1 and for mounting in the wall opening to receive same. The header 105 is provided by cutting a header corresponding to header 4 at an appropriate interior wall 12' (see Figure 2) according to the width of the side light. The sill 106 is provided by cutting a

sill corresponding to sill 5 Figure 6 at an appropriate interior wall, eg. 47a, according to the width of the side light.

After the frames 1 and 103 are secured together in abutting relation
5 the combined frames are given an integrated look by adding an aluminum profile piece 107 corresponding to the member 62 shown in Figure 20 which extends the length of the combined frames. To accommodate this continuous profile piece 107 bridging across the combined frames, the forward edges of the adjoining bottoms of these frames are notched at 108 and 109
10 respectively. It will be understood that, if desired, the sills 5 and 106 could also be made as a continuous piece with appropriate notching of the rearward edges of the bottoms of the abutting frame jambs.


After assembling frames 1 and 103, a separate frame molding 110 is
15 then applied with the header 111 and jambs 112 being cut from the elongated molding shown in Figures 7 and 7a at the appropriate lengths.

It will be understood that the door frame assembly may, if desired, also include a transom frame using a header 4 and short jambs involving the
20 basic structure of the jambs 2 and 3.

While the preferred embodiments of the structure of composite compression molding frames and components according to the invention have been described, it will be understood that variations in the structural details of
25 these frames and components may be made and they may be compression molded from a very wide range of composite materials comprising particulate materials bonded together by a thermoplastic binder all within the scope of the appended claims.

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A door frame assembly comprising a pair of jambs and a header for
5 connecting said jambs, each said jambs and header being a compression
molding of filler, waste, or recycled particulate material bound together by a
thermoplastic binder, each said jambs presenting, when assembled with said
header, an inwardly facing planar surface of a width to receive a door to be
mounted in said frame assembly and an inwardly projecting door stop
10 shoulder formation projecting inwardly of said planar surface.
2. A door frame assembly as claimed in Claim 1 in which said header is
formed to present, when assembled with said jambs, a downwardly facing
planar surface of a width to receive a door and adapted to register with said
15 jamb planar surfaces, said header further having a downwardly projecting
door stop shoulder formation adapted to register with said jamb door stop
shoulder formations.
3. A door frame assembly as claimed in Claim 2 in which each of said
20 jambs and header members is formed with an integral molding at one face
thereof presented as an exterior frame face when assembled to define a door
receiving opening, each said integral molding comprising an L-shaped leg
having a short laterally extending leg portion extending perpendicular to its
respective exterior frame face at a point displaced outwardly from said door
25 receiving opening and a longer outwardly extending leg portion extending
outwardly of said door receiving opening and perpendicular to said short leg.
4. A door frame assembly as claimed in Claims 1, 2 or 3 in which said
thermoplastic binder is recycled or waste thermoplastic material.
30
5. A door frame assembly as claimed in Claims 1, 2 or 3 provided with a
groove between said planar door receiving surface and said shoulder
formation for mounting a resilient flexible weather strip.

- 22 -

6. A door frame assembly as claimed in Claims 1, 2 or 3 in which said jambs and said header are formed to provide interengaging formations for locating same in correct registered relation for assembly.
- 5 7. A door frame assembly as claimed in Claims 1, 2 or 3 further having a sill being a compression molding of filler, waste, or recycled particulate material bonded together by a recycled thermoplastic binder.
- 10 8. A door frame assembly as claimed in Claims 1, 2 or 3 further having a sill, said sill being a compression molding of filler, waste or recycled particulate material bonded together by a recycled thermoplastic binder, said sill and jambs being provided with interengaging formations for locating same in correct registered relation for assembly.
- 15 9. A door frame assembly comprising a pair of jambs and a header for connecting the tops of said jambs to present a door receiving opening, each of said jambs and header comprising a compression molding of filler, waste, or recycled particulate material bonded together with a thermoplastic binder and formed to present first and second adjoining parallel longitudinal channels
- 20 having their bottoms facing inwardly of said door receiving opening, said first channel presenting a planar bottom surface of a width to receive the edge of a door to be mounted in said opening, said second channel being deeper than said first channel and presenting a planar bottom surface disposed inwardly of said first channel bottom surface, said second channel defining with said first
- 25 channel a door stop shoulder formation, said parallel channels having a common longitudinal side wall and a longitudinal side wall spaced from said common side wall, said side walls terminating in a common plane.
- 30 10. A door frame assembly as claimed in Claim 9 in which said channels are formed with end walls joining their said side walls.
11. A door frame assembly as claimed in Claim 10 in which said planar bottom surface of said first channel has a weather strip retaining slot formed therein extending into said common leg.

12. A door frame assembly as claimed in Claim 11 in which said second deeper channel of each of said jamb members terminates short of the upper end of said jamb member to provide a support ledge for supporting said header.

13. A door frame assembly as claimed in Claims 9, 10 or 11 in which the interior of at least said first channel is formed with an arrangement of integral thickened areas adapted to receive and support fasteners introduced therethrough.

14. A door frame assembly as claimed in Claims 9, 10 or 11 in which said jambs and header are formed to provide interengaging registering formations for registering same in proper relative position preparatory to securing same together.

15. A door frame assembly as claimed in Claims 9, 10 or 11 in which said jambs and header further have a L-shaped molding formed integral therewith, said L-shaped molding comprising a first short leg extending away from the non-common side wall of one of said channel formations parallel to the planar surface of said one channel formation but offset outwardly of said door receiving opening therefrom, and a second longer leg extending outwardly of said door receiving opening and parallel to said channel walls.

16. A door frame assembly as claimed in Claims 9, 10 or 11 in which said jambs and header further have a L-shaped molding formed integral therewith, said L-shaped molding comprising a first short leg extending away from the non-common side wall of one of said channel formations parallel to the planar surface of said one channel formation but offset outwardly of said door receiving opening therefrom, and a second longer leg extending outwardly of said door receiving opening and parallel to said channel walls the upper ends of said L-shaped legs of said jambs and the ends of said L-shaped leg of said header being formed to meet in a mitered joint.

- 24 -

17. A door frame assembly as claimed in Claims 9, 10 or 11 in which one of said jambs to which a door is to be hinged has its said planar bottom surface of its said first channel formed with hinge receiving recesses and the interior of said latter first channel opposite said hinge receiving recesses is formed with a pattern of integral interior pods to receive fasteners for securing hinges
5 received in said recesses.

18. A door frame assembly as claimed in Claims 9, 10 or 11 in which said first channels of said jambs and headers are formed with interior pods adjacent
10 their common walls, said pods having holes therethrough for the passage of fasteners therethrough to secure said jambs and header to a door frame receiving opening.

19. A door frame assembly as claimed in Claims 9, 10 or 11 in which the
15 planar bottom surface of the first channel of one of said jambs is formed with hinge receiving recesses and the other of said jambs is provided with recesses in the planar bottom surface of its first channel to receive a striker plate and door latching hardware, said jambs having an arrangement of integral internal blocks of material opposite said recesses formed to receive said fasteners and
20 door hardware.

20. A door frame assembly comprising a pair of jambs, a header for connecting the tops of said jambs and a sill for connecting the bottoms of said jambs to present a door receiving opening, each of said jambs, header and sill
25 comprising a compression molding of filler, waste, or recycled particulate material bonded together with a thermoplastic binder, said jambs and header each being formed to present first and second adjoining parallel longitudinal channels having planar bottom surfaces facing inwardly of said door receiving opening, said first channel planar bottom surface being of a width to receive
30 the edge of a door to be mounted in said opening, said second channel being deeper than said first channel with its said planar bottom surface disposed inwardly of said first channel bottom surface, said second channel defining with said first channel a door stop shoulder formation, said parallel channels having a common longitudinal side wall and a longitudinal side wall spaced

- 25 -

from said common side wall, said side walls having outer edges terminating in a common plane.

5 21. A door frame assembly as claimed in Claim 20 in which said channels are formed with end walls joining their said side walls.

22. A door frame assembly as claimed in Claim 21 in which said planar bottom surface of said first channel of each of said jambs and header has a weather strip retaining slot formed therein extending into said common leg.

10

23. A door frame assembly as claimed in Claim 22 in which said second deeper channel of each of said jamb members terminates short of the upper end of said jamb member to provide a support ledge for supporting said header.

15

24. A door frame assembly as claimed in Claims 21, 22 or 23 in which the interior of at least said first channel is formed with an arrangement of integral thickened ares adapted to receive and support fasteners introduced therethrough.

20

25. A door frame assembly as claimed in Claims 21, 22 or 23 in which said jambs, header and sill are formed to provide interengaging registering formations for registering same in proper relative position preparatory to securing same together.

25

26. A door frame assembly as claimed in Claims 21, 22 or 23 in which said jambs and header further have an L-shaped molding formed integral therewith, said L-shaped molding comprising a first short leg extending away from the non-common side wall of one of said channel formations parallel to the planar surface of said one channel formation but offset outwardly of said door receiving opening therefrom, and a second longer leg extending outwardly of said door receiving opening and parallel to said channel walls.

30

27. A door frame assembly as claimed in Claims 21, 22 or 23 in which said jambs and header further have an L-shaped molding formed integral therewith, said L-shaped molding comprising a first short leg extending away from the non-common side wall of one of said channel formations parallel to the planar surface of said one channel formation but offset outwardly of said door receiving opening therefrom, and a second longer leg extending outwardly of said door receiving opening and parallel to said channel walls, the upper ends of said L-shaped legs of said jambs and the ends of said L-shaped leg of said header being formed to meet in a mitered joint.
28. A door frame assembly as claimed in Claims 21, 22 or 23 in which one of said jambs to which a door is to be hinged has its said planar bottom surface of its said first channel formed with hinge receiving recesses and the interior of said latter first channel opposite said recesses is formed with a pattern of interior pods to receive fasteners for securing hinges received in said recesses.
29. A door frame assembly as claimed in Claims 21, 22 or 23 in which said first channels of said jambs and headers are formed with interior pods adjacent their common walls, said pods having holes therethrough for the passage of fasteners therethrough to secure said jambs and header to a door frame receiving opening.
30. A door frame assembly as claimed in Claims 21, 22 or 23 in which the planar bottom surface of said first channel of one of said jambs is formed with hinge receiving recesses and the other of said jambs is provided with recesses in said planar bottom surface of its said first channel to receive a striker plate and door latching hardware, said jambs having an arrangement of integral internal blocks of material opposite said recesses formed to receive said fasteners and said jamb having recesses to receive said striker plate and door latching hardware having integral internal hollowed blocks of material behind said last mentioned recesses.

31. A frame assembly including a pair of jambs and a header for joining said jambs to define a door receiving opening, each said jambs and header being a compression molding of particulate material bonded together with a thermoplastic binder, each said jambs comprising an elongated box structure
5 having a longitudinally extending stepped bottom wall for presentation inwardly of said door receiving opening, said stepped bottom wall presenting a first step having a planar surface of a width to receive the edge of a door, and a second step extended inwardly of said first step and presenting a planar surface, the juncture of said steps defining a door stop shoulder, each of said
10 jamb box structures having a network of interior reinforcing supports.
32. A frame assembly as claimed in Claim 31 in which said second step terminates short of at least the upper end of said jambs to provide a support ledge for mounting said header.
15
33. A frame assembly as claimed in Claims 31 or 32 further including a sill, said sill being a compression molding of particulate material bonded together by a thermoplastic binder.
- 20 34. A frame assembly as claimed in Claim 32 further including a sill, said sill being a compression molding of particulate material bonded together by a thermoplastic binder and said second step of each of said jambs terminates short of the bottom end of its respective jamb to provide a ledge for seating on said sill.
- 25 35. A frame assembly as claimed in Claims 31, 32 or 34 in which said header comprises an elongated box structure having a longitudinally extending stepped bottom wall for presentation inwardly of said door receiving opening said stepped bottom wall presenting a first step having a
30 planar surface of a width to receive the edge of a door and a second step extended inwardly of said first step presenting a planar surface, the juncture of said steps defining a door stop shoulder, said header box structure having a network of interior reinforcing supports.

- 28 -

36. A frame assembly as claimed in Claim 31, 32 or 34 in which each of said jambs has an integral L-shaped molding formed therewith comprising a first short leg perpendicular to one of said steps displaced outwardly of said door receiving opening from said planar surface of said one step, and a second
5 leg extending outwardly of said door receiving opening and perpendicular to said first leg.

37. A frame assembly as claimed in Claim 31 in which said header comprises an elongated box structure having a longitudinally extending
10 stepped bottom wall for presentation inwardly of said door receiving opening said stepped bottom wall presenting a first step having a planar surface of a width to receive the edge of a door and a second step extended inwardly of said first step presenting a planar surface, the juncture of said steps defining a door stop shoulder, said header box structure having a network of interior
15 reinforcing supports, each of said jambs and header being formed with a weather strip receiving groove at the juncture of their first and second steps.

38. A frame assembly as claimed in Claim 37 in which each of said jambs and header is formed with an integrally molded L-shaped molding comprising
20 a first short leg extending laterally to corresponding one of said steps of said jambs and header parallel to the planar surface of said one of said steps but retracted therefrom, and a second longer leg extending outwardly of said door receiving opening and perpendicular to said first leg.

25 39. A jamb for incorporation into a door or window receiving frame comprising an elongated box structure comprising a compression molding of particulate filler, waste, or recycled material bonded together with a thermoplastic material, said box structure having a longitudinally extending stepped bottom wall to be presented facing inwardly of a door or window
30 receiving opening when said jamb is incorporated into a door or window receiving frame, said stepped bottom wall presenting a first step having a planar surface of a width to receive the edge of a door or window, and a second step extended inwardly of said first step to define with said first step a shoulder stop.

40. A jamb as claimed in Claim 39 having a network of interior reinforcing supports.
- 5 41. A jamb as claimed in Claim 40 in which said second step has a planar surface.
42. A jamb as claimed in Claim 41 in which said second step stops short of the top of said jamb to define a support ledge for mounting a header.
- 10 43. A jamb as claimed in Claim 42 in which said second step stops short of the bottom of said jamb to define the ledge for seating on a sill.
44. A jamb as claimed in Claim 39 provided with a weather strip
15 mounting groove in said stepped bottom at the juncture of said steps.
45. A jamb as claimed in Claim 44 having a longitudinal interior wall at the juncture of said steps.
- 20 46. A jamb as claimed in Claim 45 for a door receiving frame having hinge mounting recesses formed in the planar surface of said first step and having interior fastener receiving pods opposite said mounting recesses.
47. A jamb as claimed in Claim 45 for a door receiving jamb having at
25 least one opening to accept a door latch opening through the first step of said stepped bottom wall, said jamb having an integral hollowed block of material registering with and extending inwardly from said latch receiving opening.
48. A jamb as claimed in Claim 45 in which said first step has a row of
30 screw head receiving recesses in its said planar surface adjacent to said door stop shoulder said recesses being backed by internal bored pods of material formed integrally with said jamb to support jamb mounting screws.

- 30 -

49. A jamb as claimed in Claim 39 having header registering means formed adjacent the top thereof.

50. A jamb as claimed in Claim 39 having sill registering means formed adjacent the bottom thereof.

51. A sill member for incorporation into a frame comprising an elongated compression molding of particulate filler, waste or recycled material bonded together by a thermoplastic material.

52. A sill member as claimed in Claim 51 in which said thermoplastic material is recycled thermoplastic.

53. A sill member as claimed in Claim 51 said sill having a top wall from which depend longitudinal edge legs and end walls, said top wall having at one edge a longitudinally extending horizontal section and a longitudinal section wider than said horizontal section sloping down to the other edge.

54. A sill member as claimed in Claim 53 having a first intermediate depending longitudinal leg located between said horizontal and sloping top wall sections, and a second intermediate longitudinal depending leg depending from a point intermediate the width of said sloping section.

55. A sill member as claimed in Claim 53 in which said end walls are formed with registering means for interengaging with a jamb of a frame into which said sill is to be incorporated, said sill further being provided with inwardly projecting pods to receive and support fasteners when same are used to secure jambs to said sill.

56. A door frame sill member as claimed in Claim 53 in which walls corresponding to said end walls are duplicated interiorly of said molding at points intermediate the length of said sill whereby said sill may be cut at such points to accommodate different sill widths.

57. A molding member for attachment to a frame which comprise a pair of jambs and a header connecting said jambs, said molding member comprising a compression molded channel formed of particulate material bonded together by a thermoplastic binder and having at least one closed bevelled end.

5

58. A molding member as claimed in Claim 57 having two closed bevelled ends said molding member being adapted for attachment to the header of a frame.

10 59. A molding member as claimed in Claim 57 having a closed upper bevelled end and a right angularly closed lower end for attachment to the jamb of a frame.

60. A molding structure from which moldings for frames which comprise
15 a pair of jambs and a header connecting said jambs can be cut to accommodate different frame widths said molding structure comprising an elongated compression molded channel formed of particulate material bonded together by a thermoplastic binder, said molding structure having
longitudinally extending side walls and closed bevelled ends with the bevel at
20 one end opposite to the bevel at the other end, said channel having extending between said side walls a series of obliquely inclined transverse walls and a series of right angular transverse walls, the arrangement being such whereby cutting of said channel at selected ones of said obliquely inclined transverse
walls header moldings for different widths of frames can be provided, while
25 cutting said channel at selected ones of said right angular transverse walls jamb moldings with bevelled upper ends selected for attachment to a left hand jamb or a right hand jamb can be provided.


61. A header for incorporation into a door or window receiving frame
30 comprising an elongated box structure comprising a compression molding of particulate filler, waste, or recycled material bonded together with a thermoplastic material, said box structure having a longitudinally extending stepped bottom wall to be presented facing inwardly of a door or window receiving opening when said header is incorporated into a door or window

- 32 -

receiving frame, said stepped bottom wall presenting a first step having a planar surface of a width to receive the edge of a door or window, and a second step extended inwardly of said first step to define with said first step a shoulder stop.

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 02-04-02 11:50



ABSTRACT OF THE DISCLOSURE

A frame assembly for mounting doors and the like comprising a pair of jambs and a header for connecting said jambs, and, where required, a sill, each said jambs and header and sill where required being a compression molding of filler, waste, or recycled particulate material bound together by a thermoplastic binder, each said jambs and header presenting when assembled an inwardly facing planar surface of a width to receive a door to be mounted in said frame assembly and an inwardly projecting door stop shoulder formation projecting inwardly of said planar surface. Also the novel components for such a frame assembly comprising the jambs, the header and the sill.

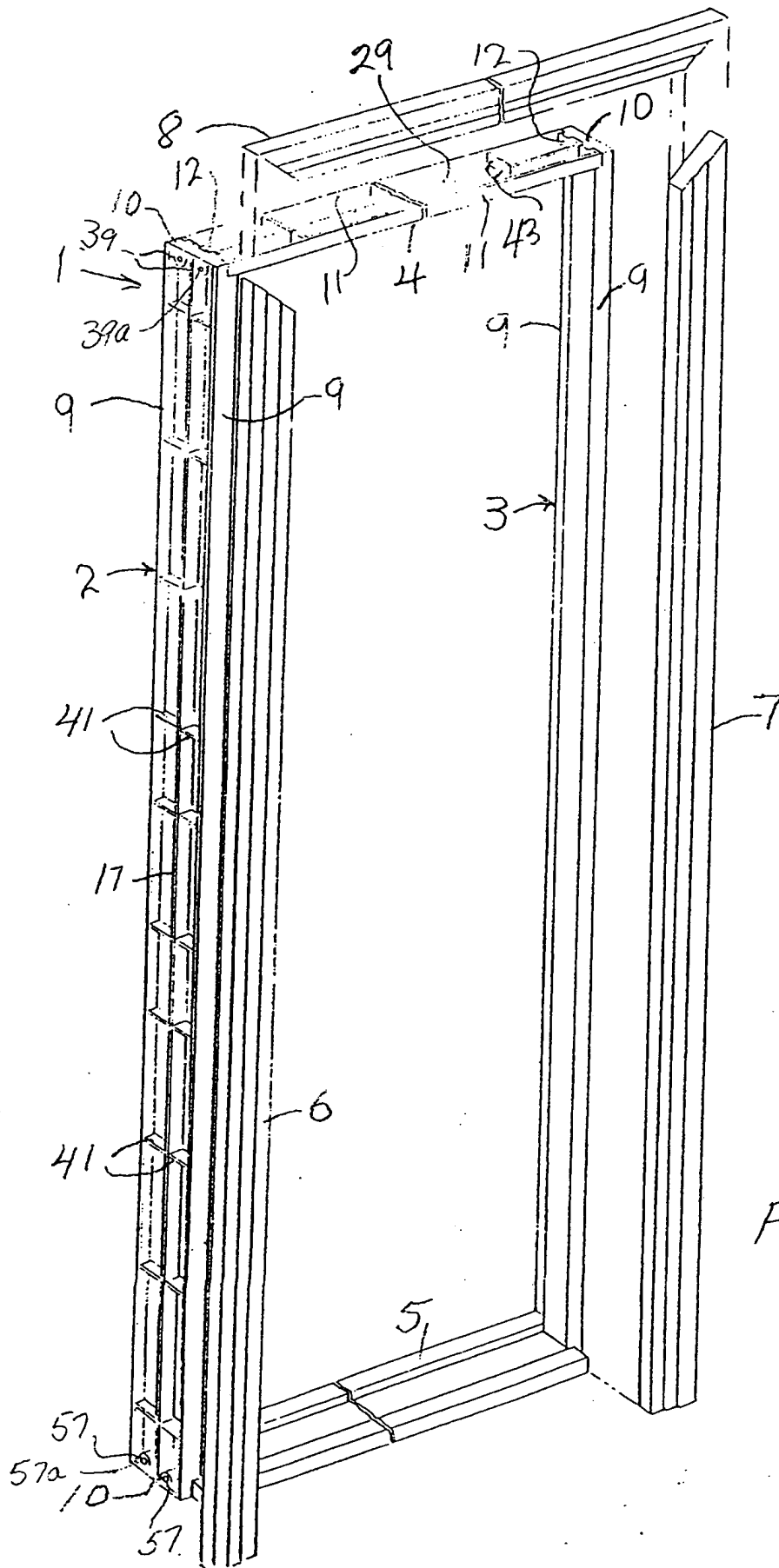
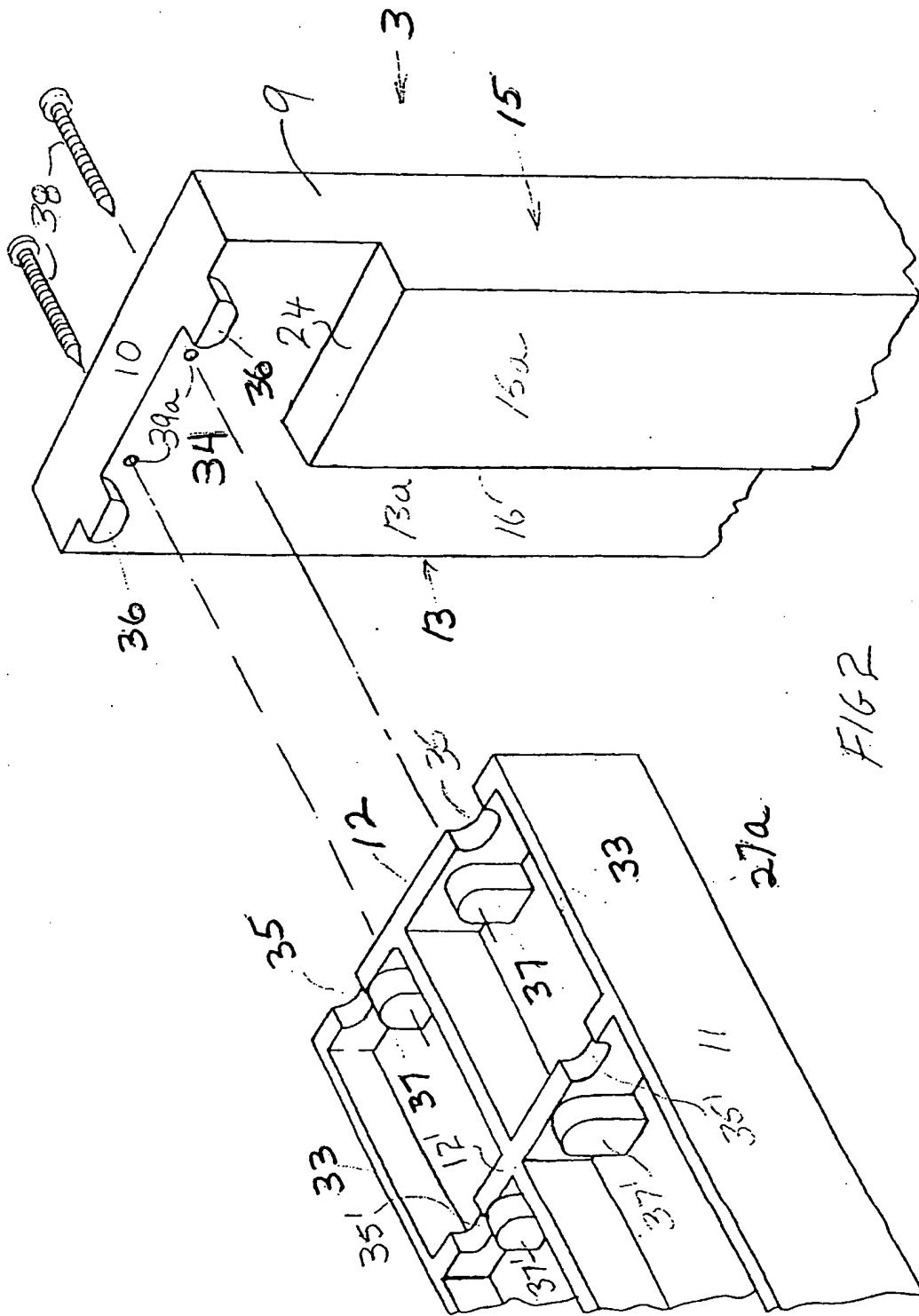
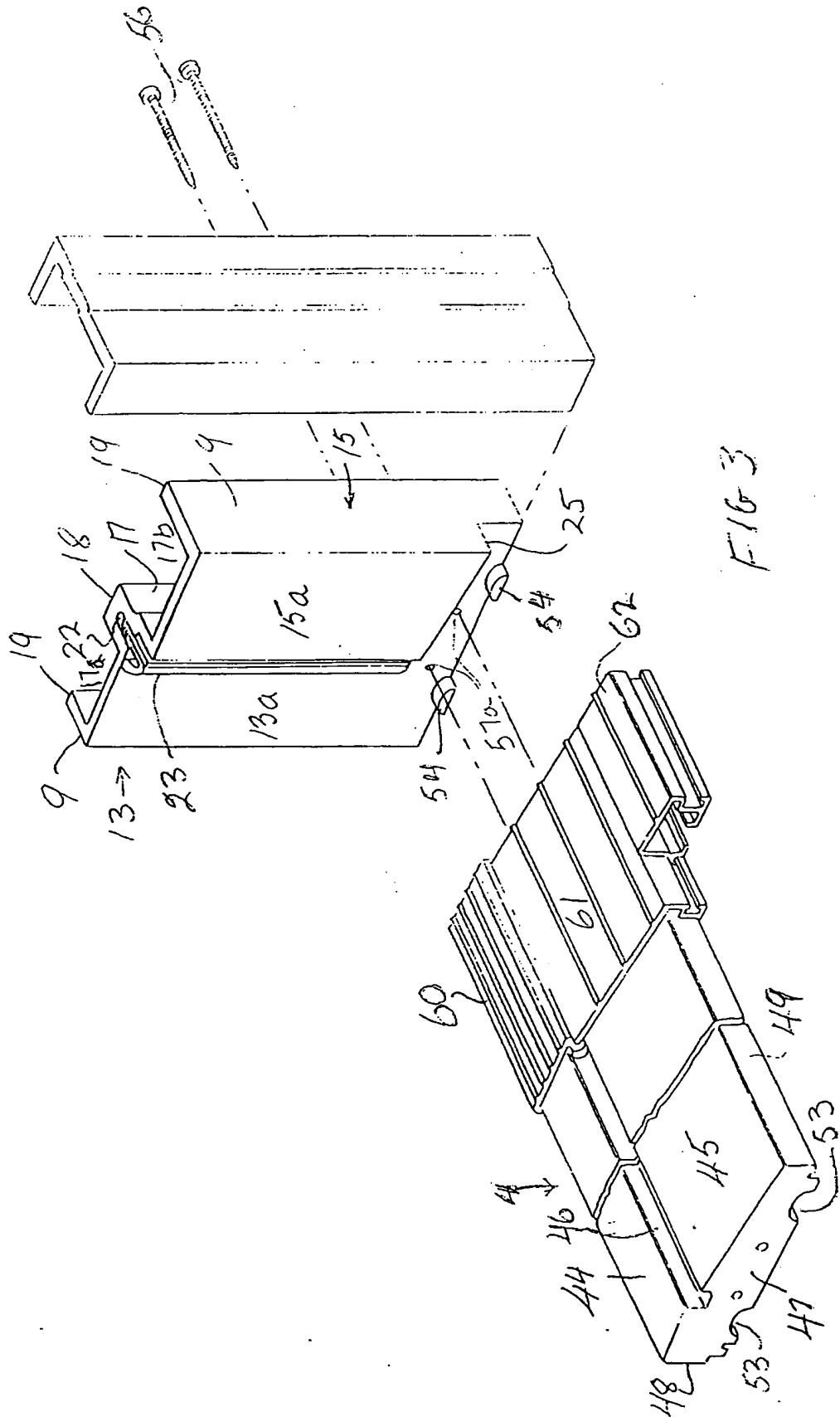
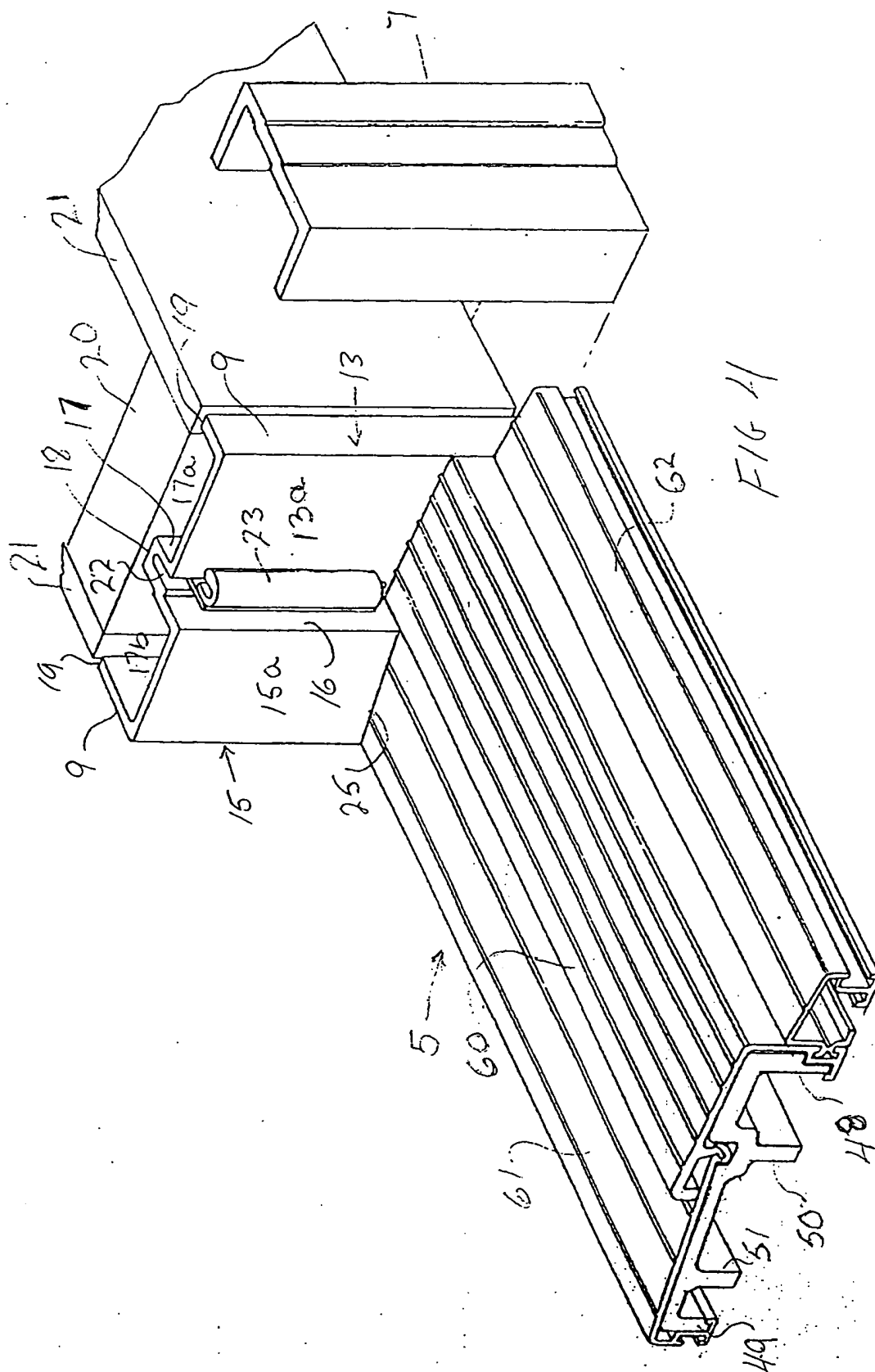
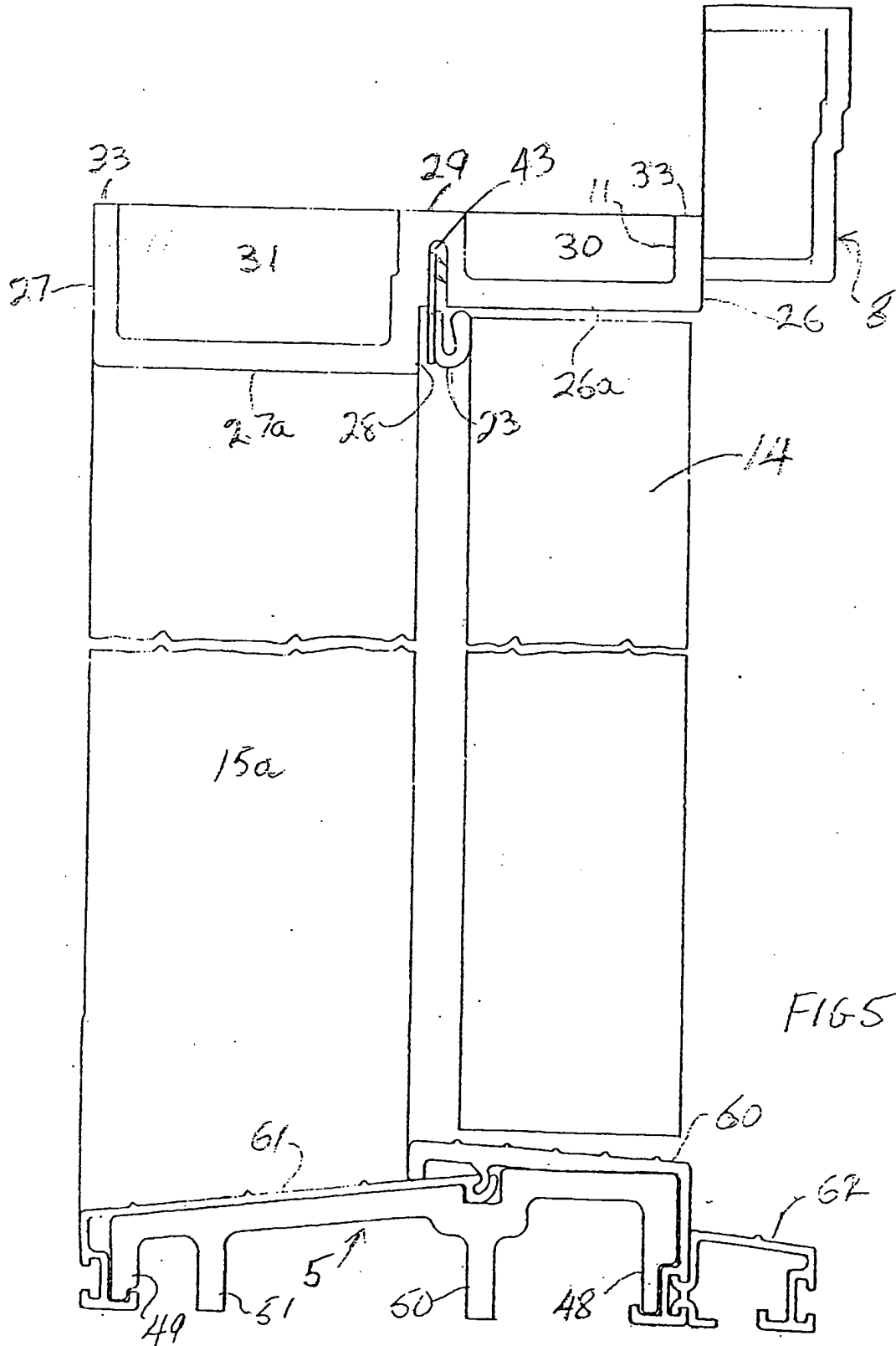


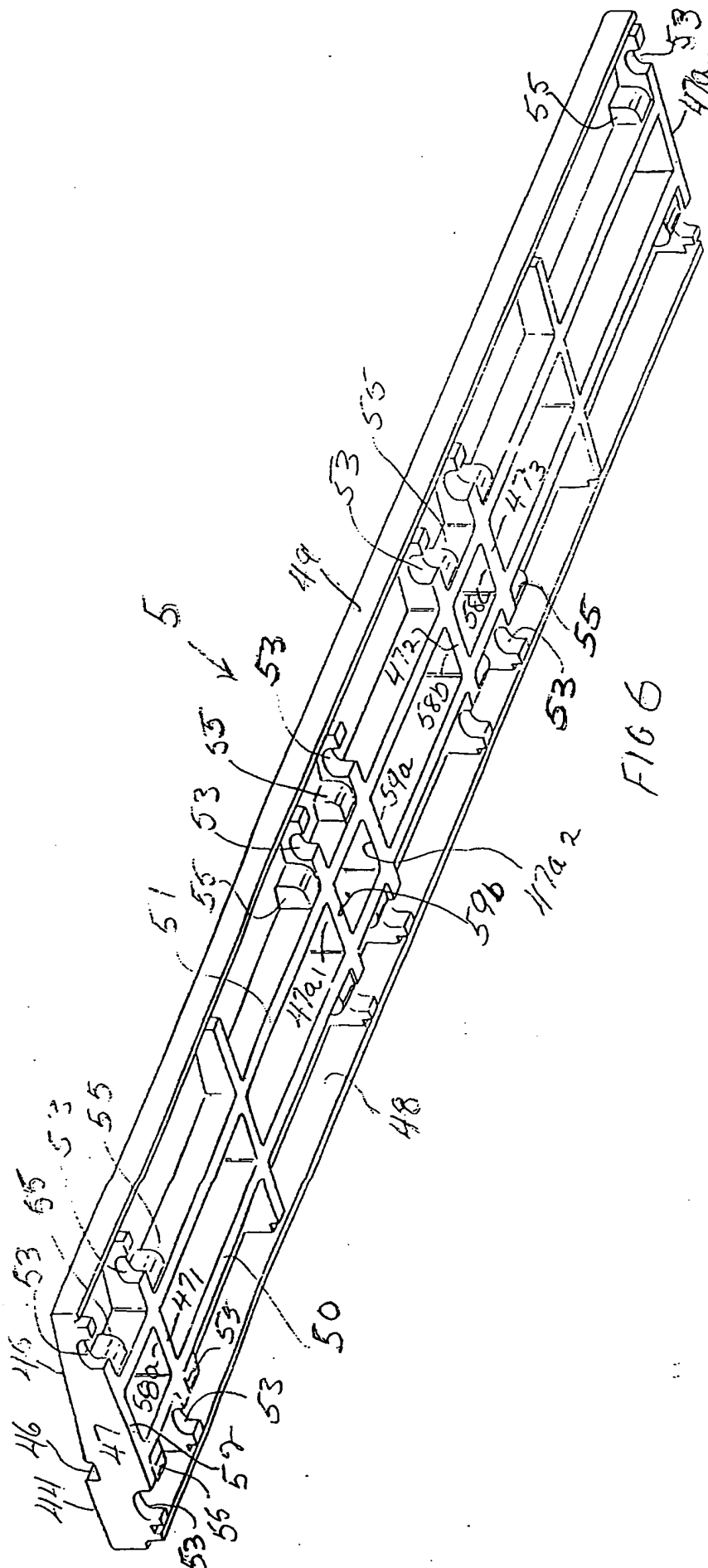
FIG 1

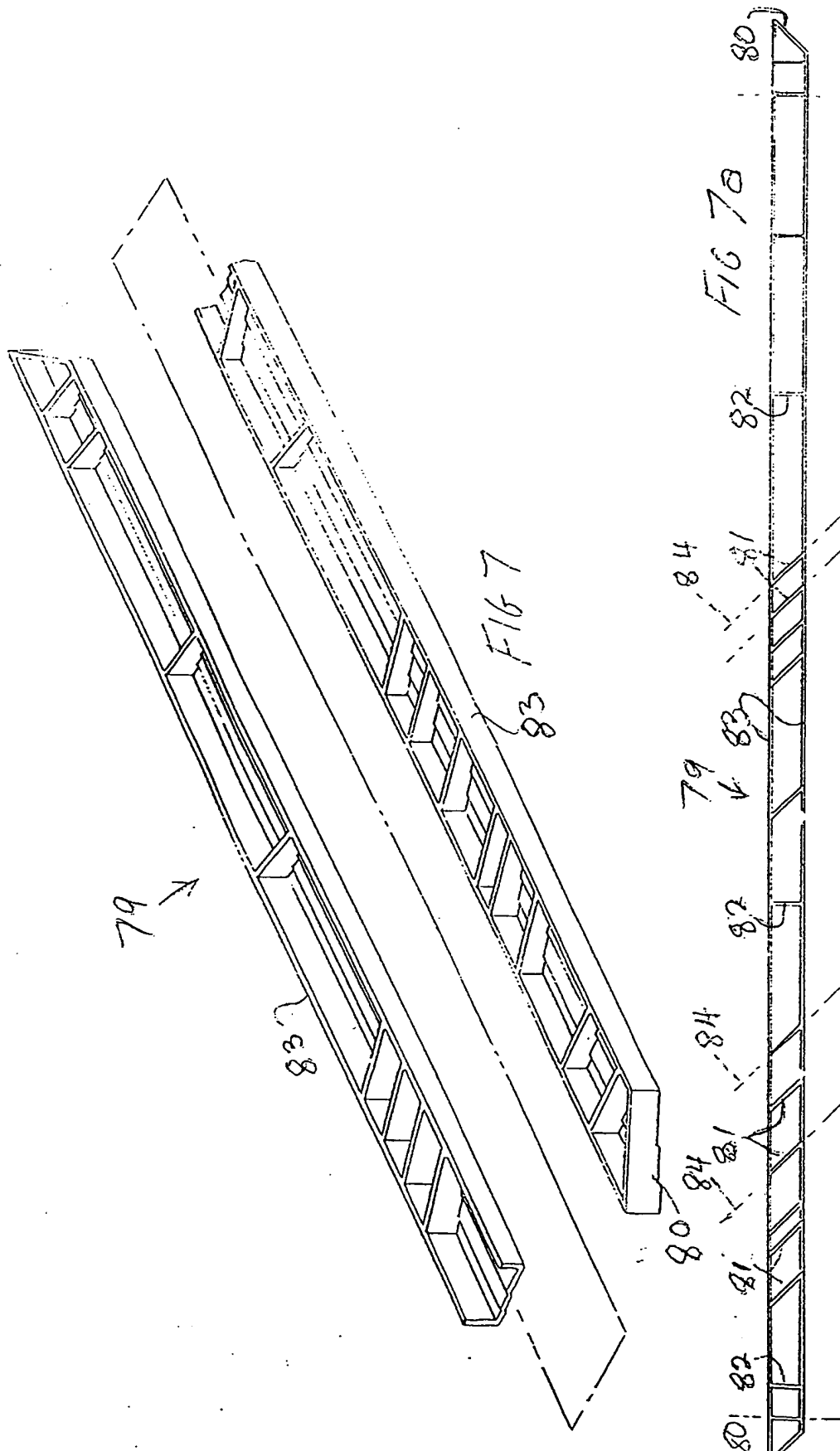


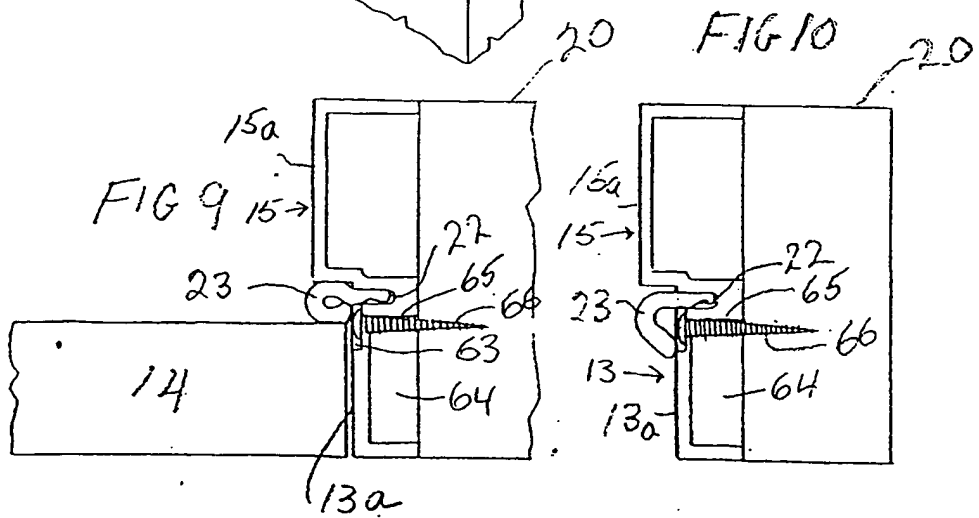
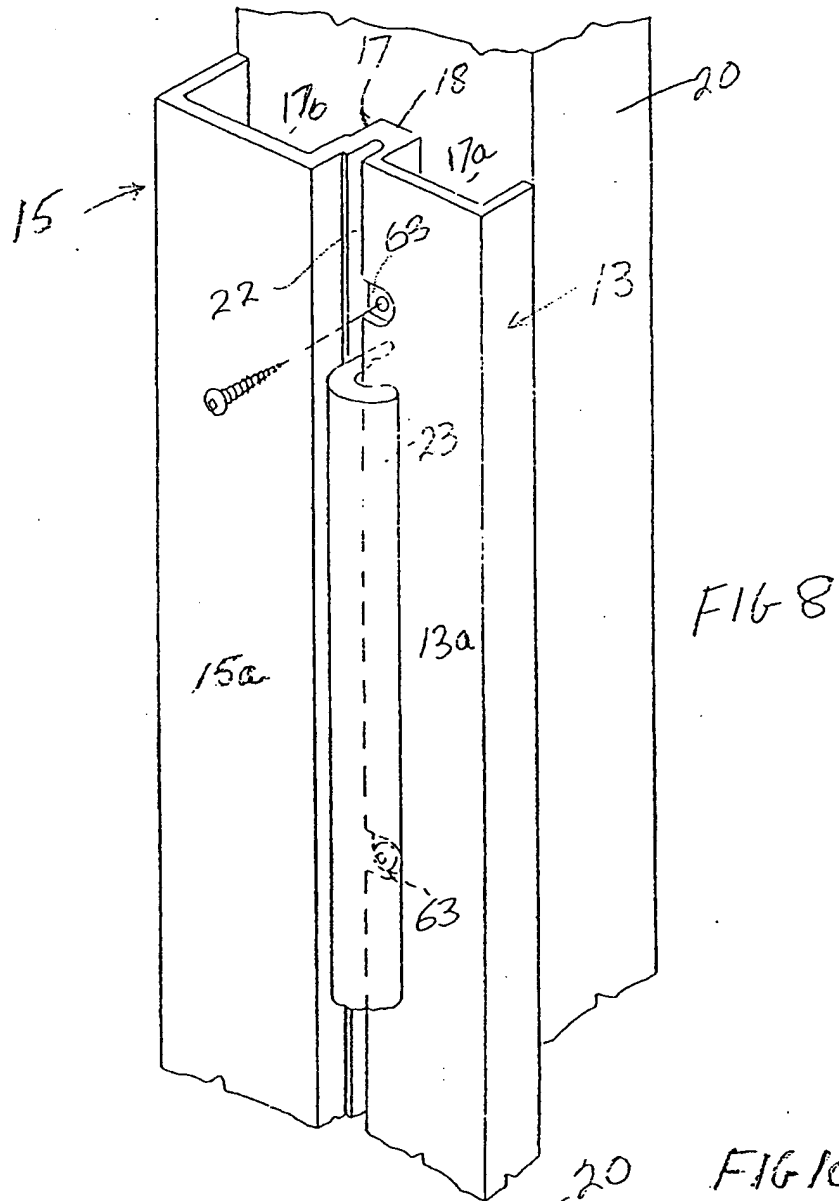


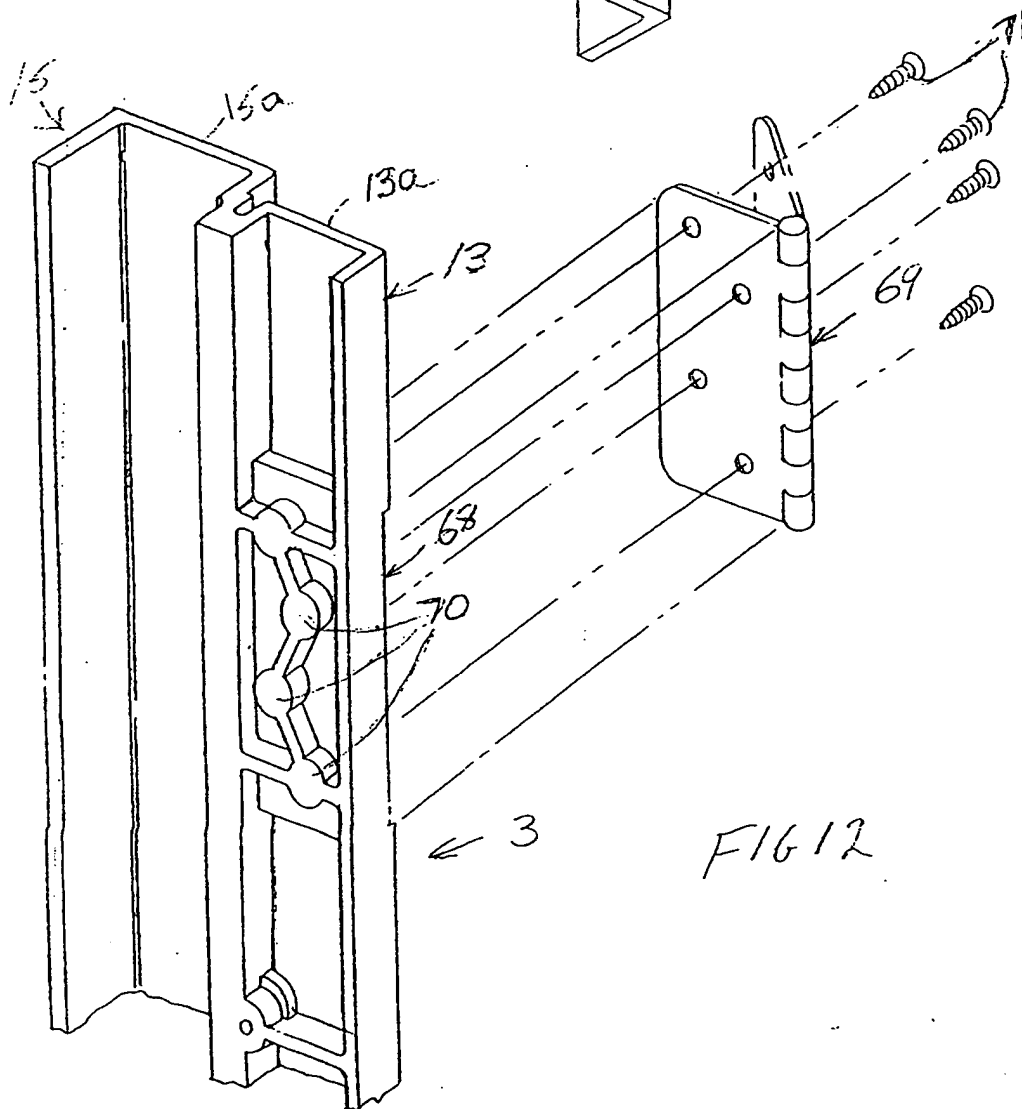
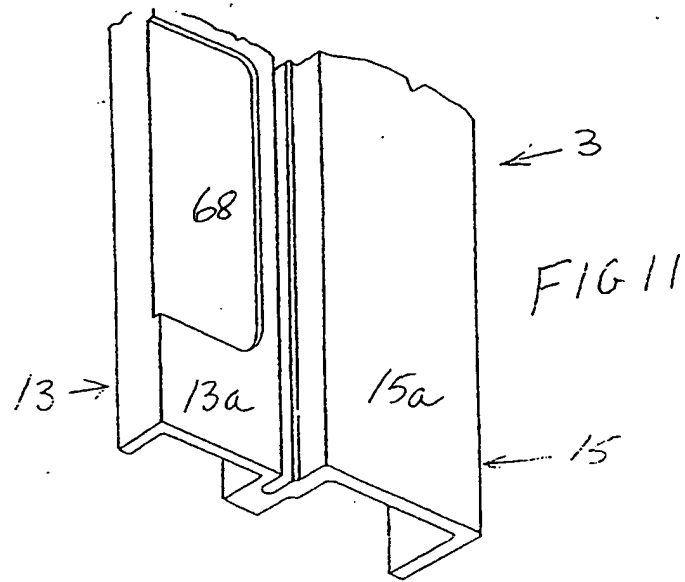


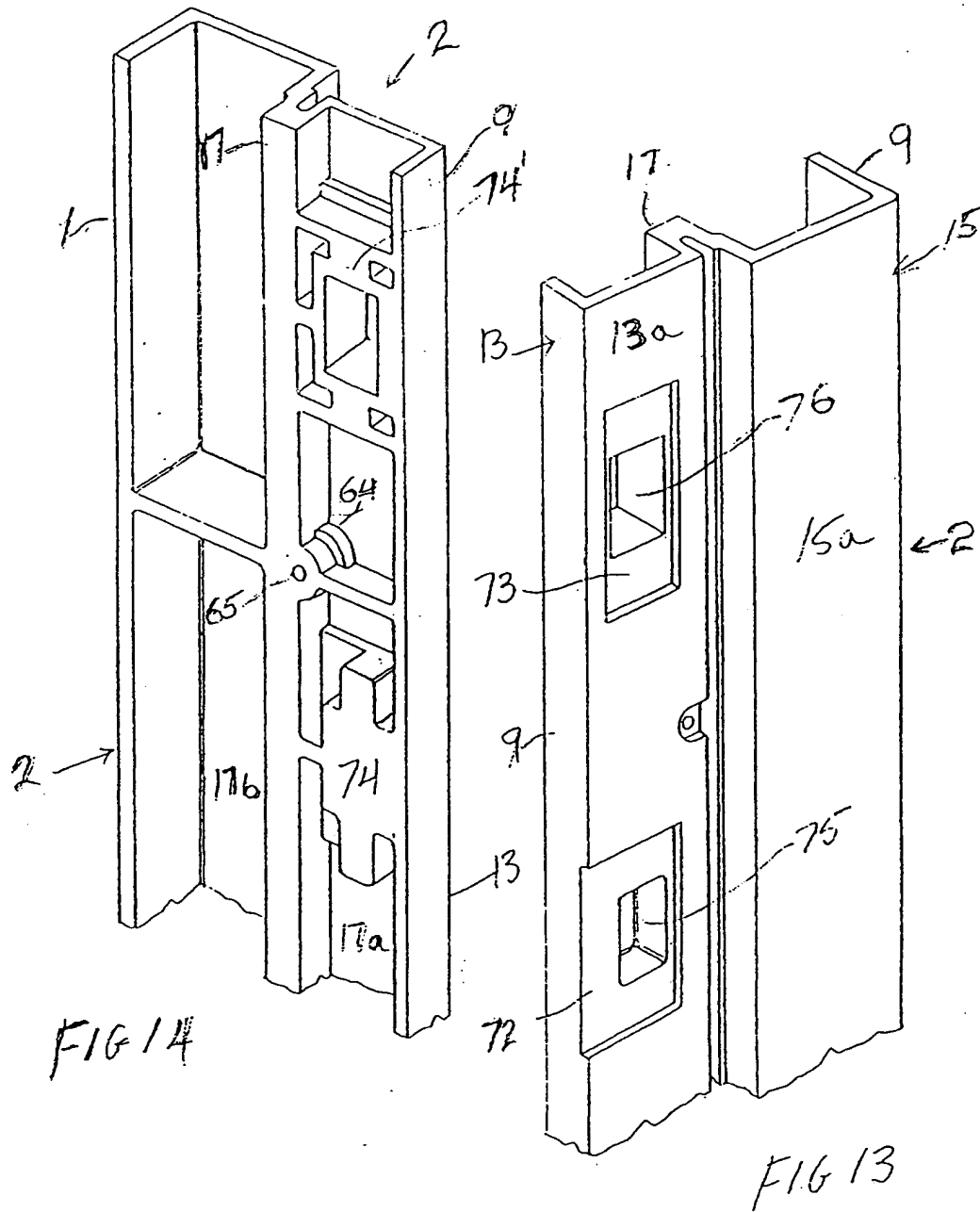


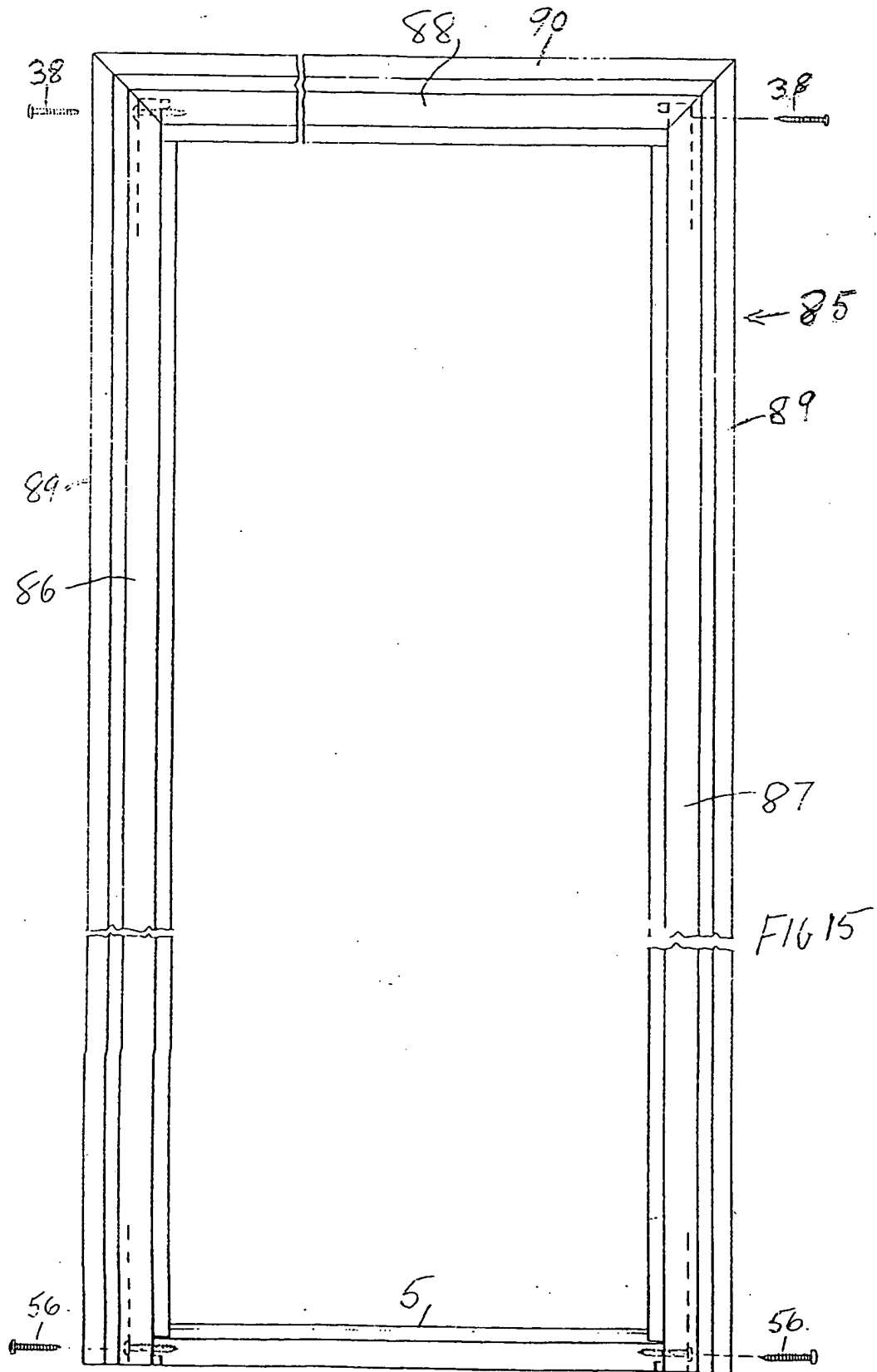


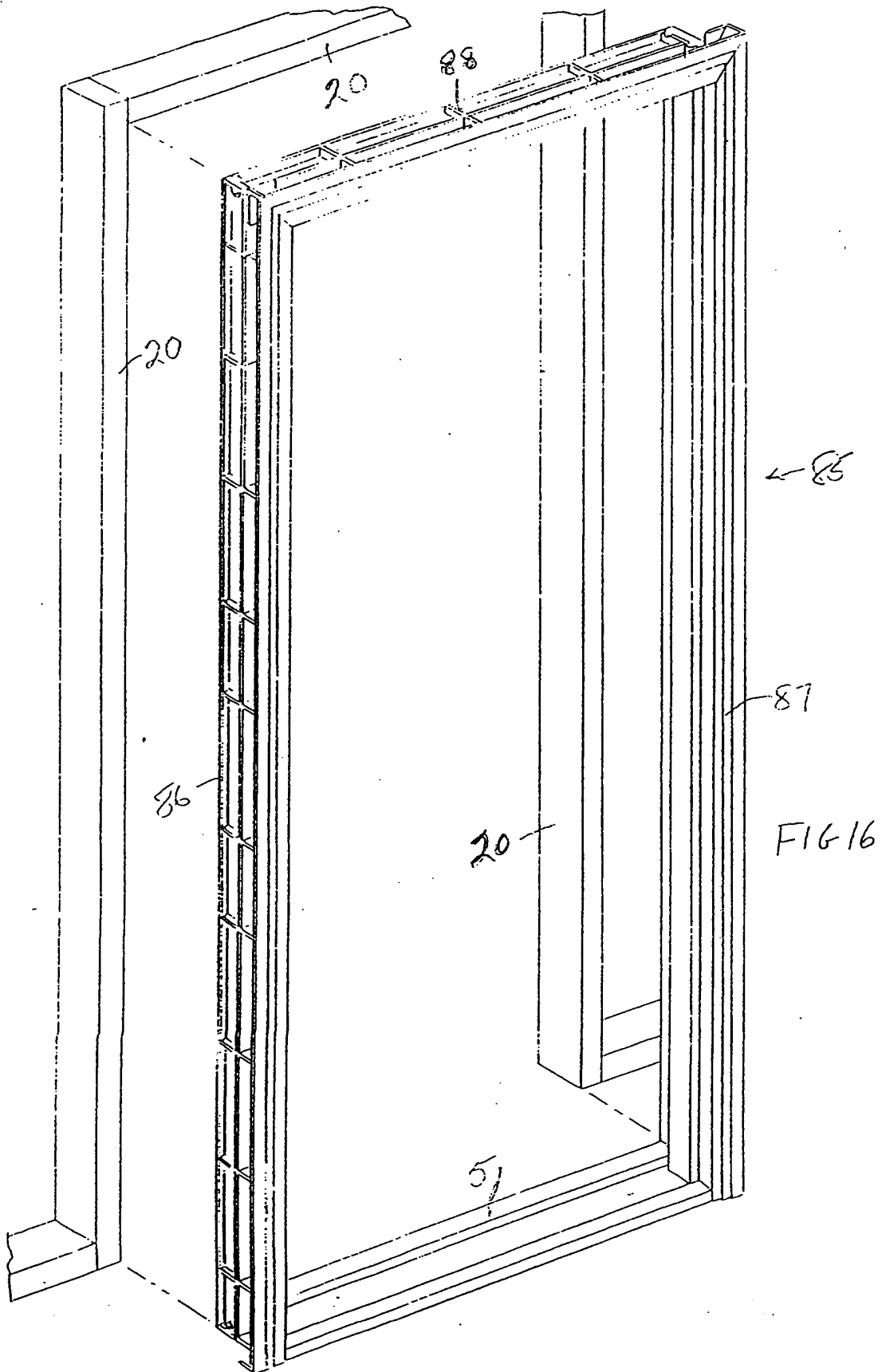


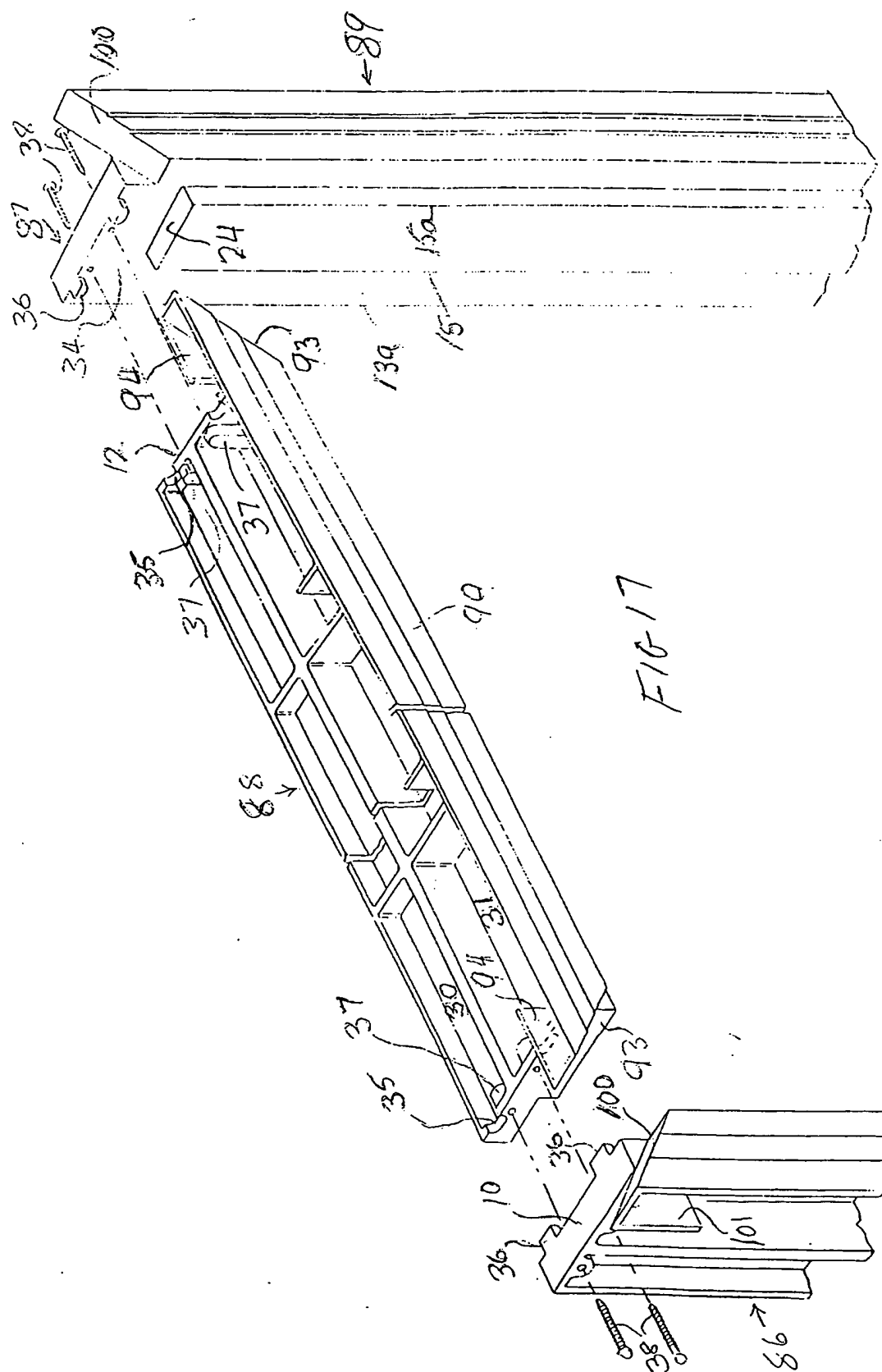


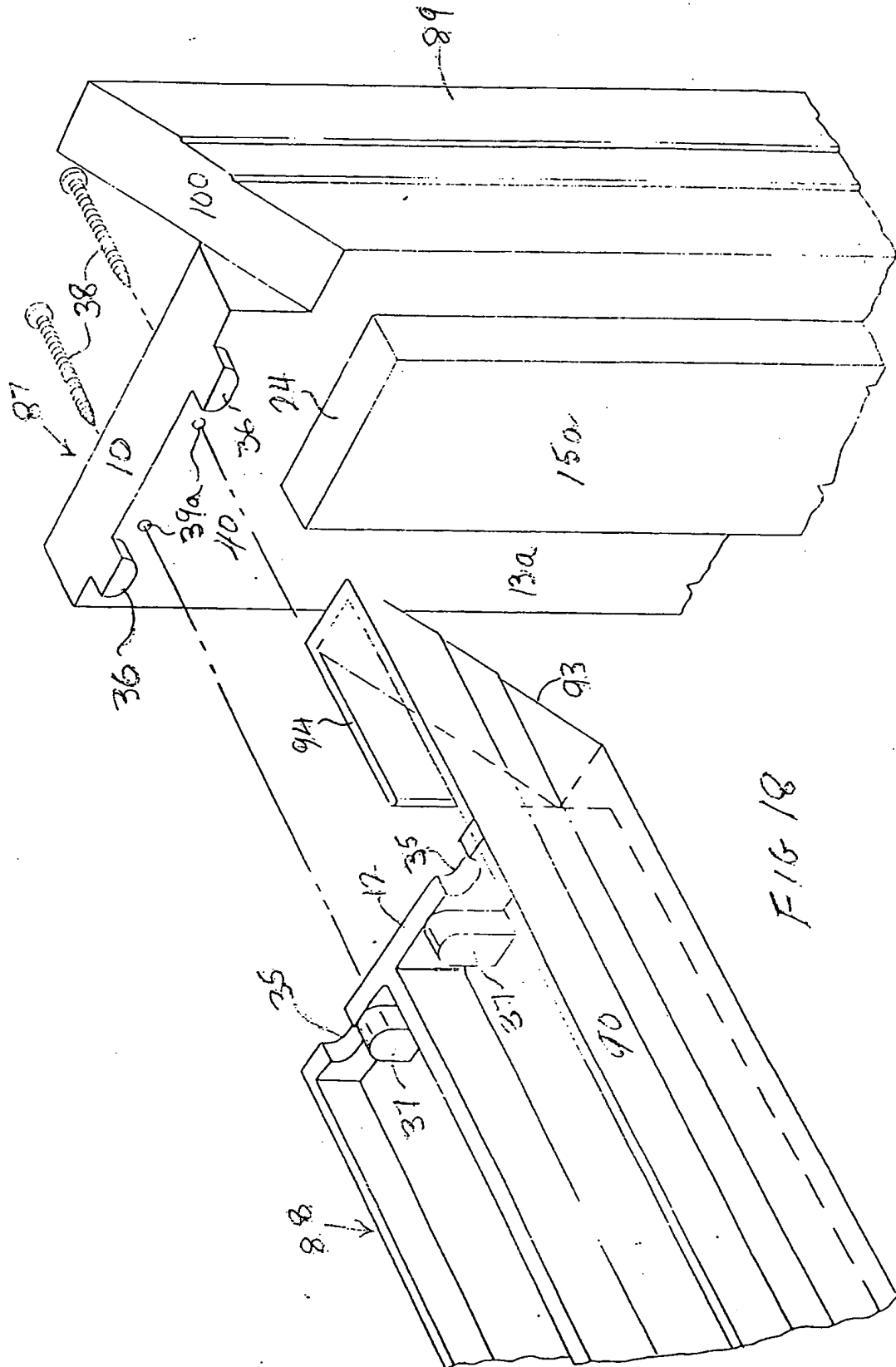


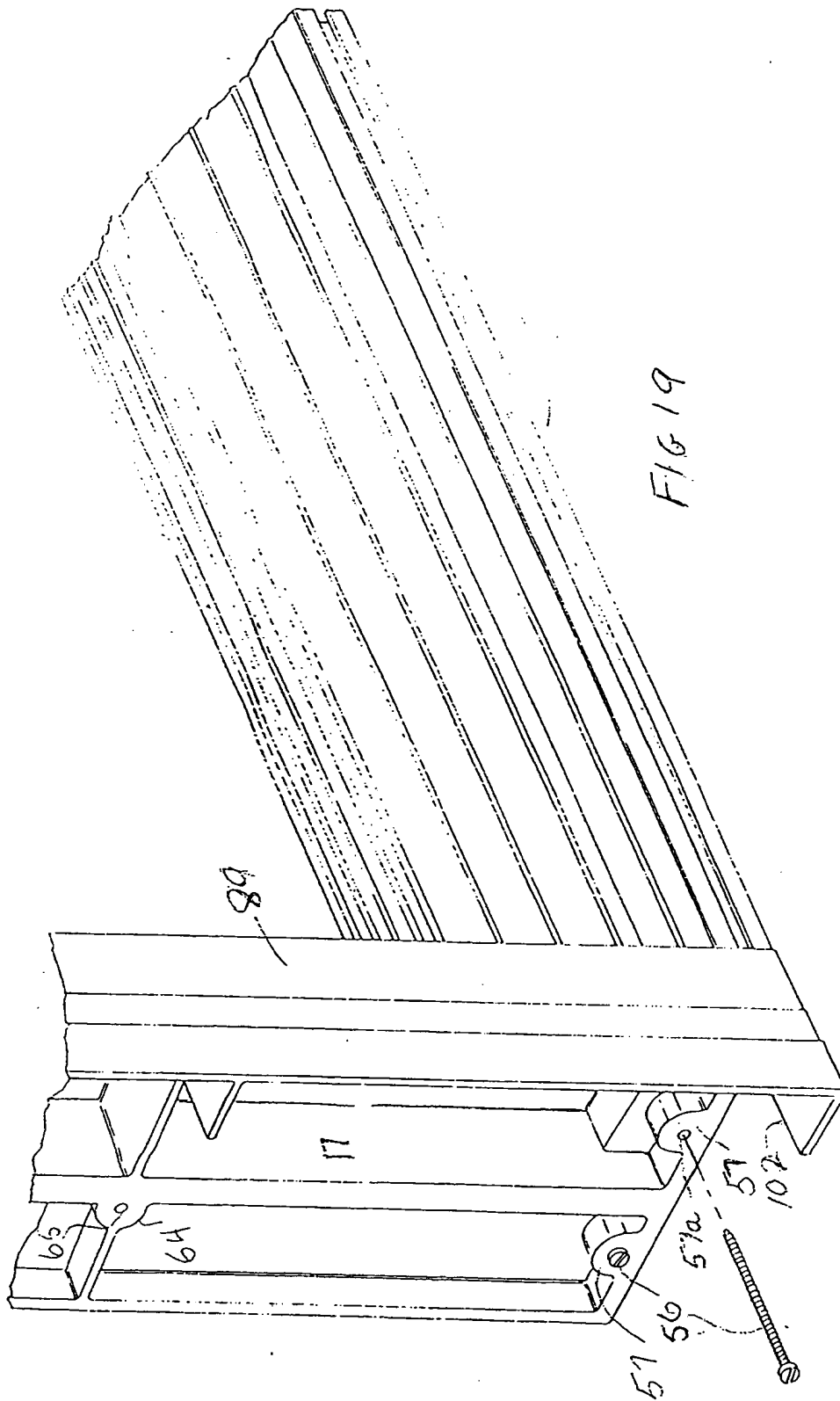


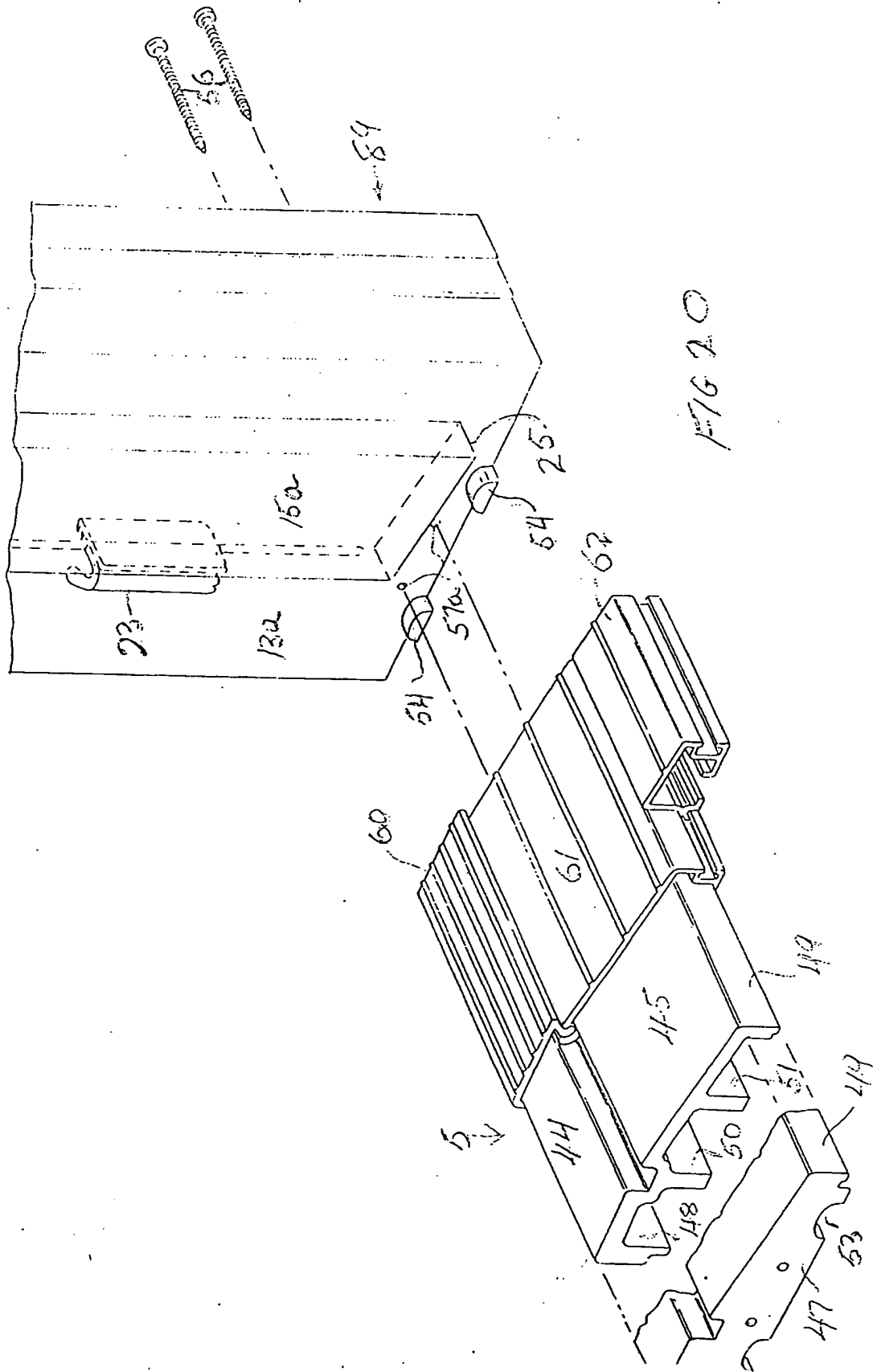


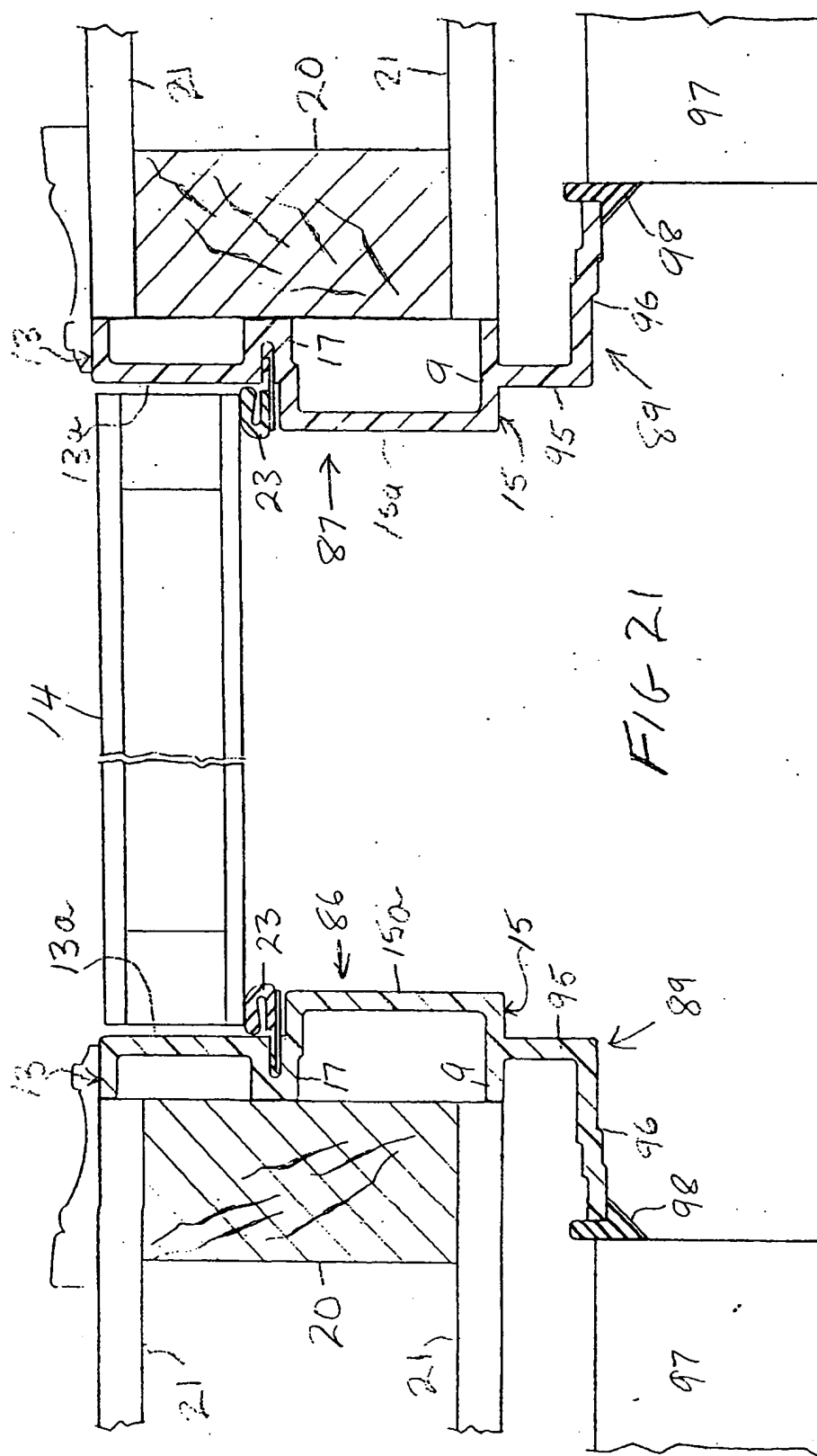


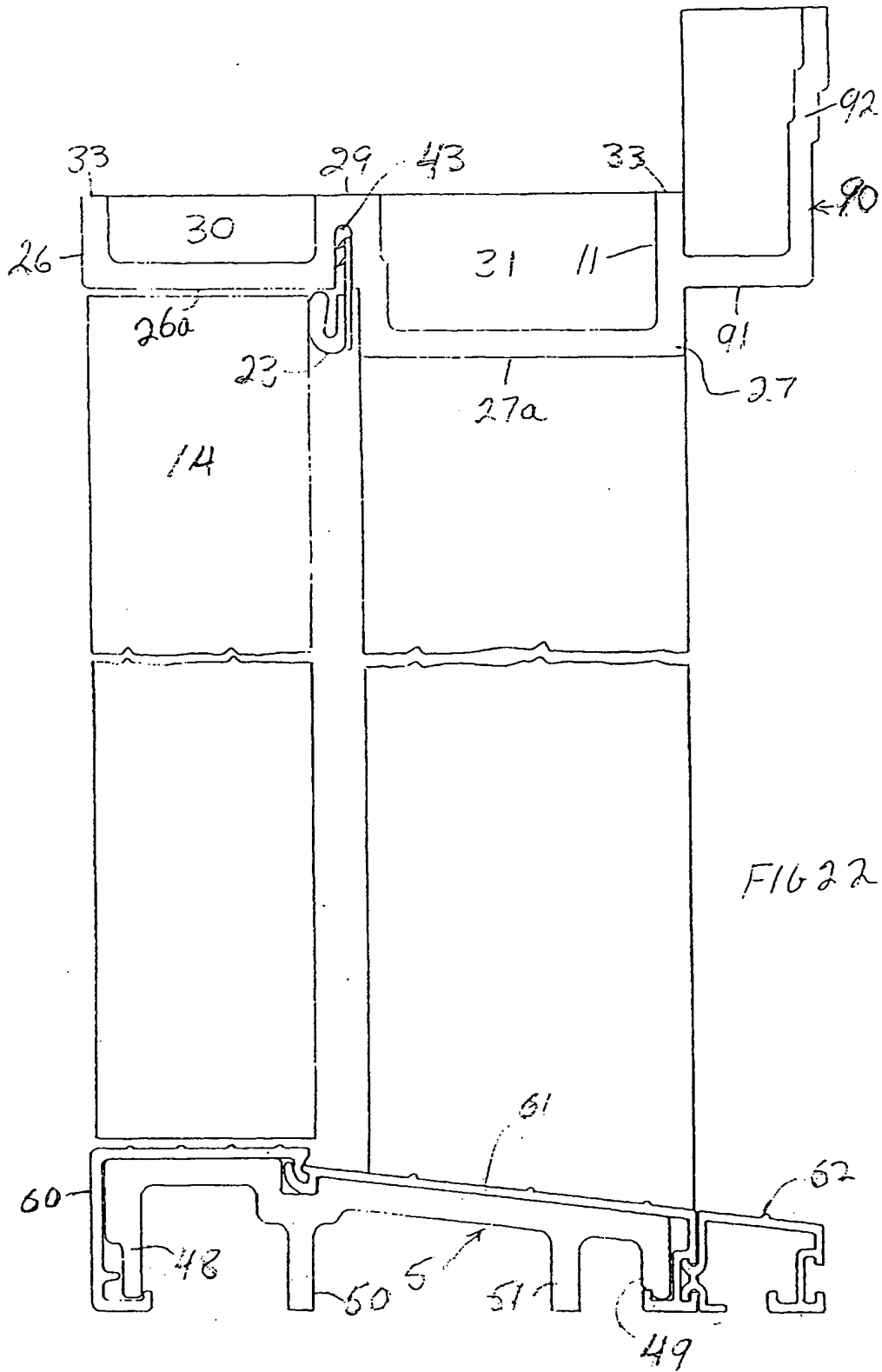


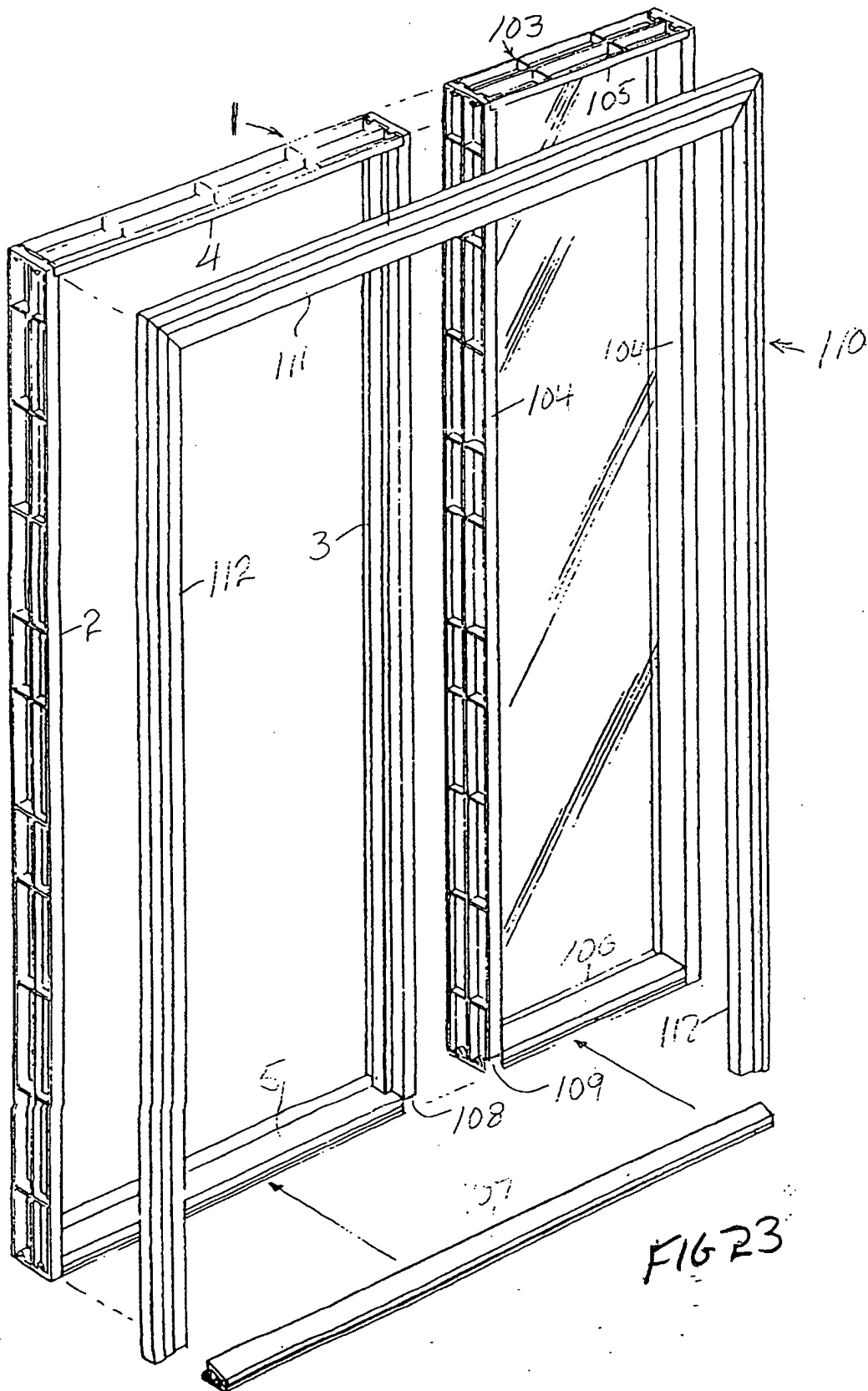












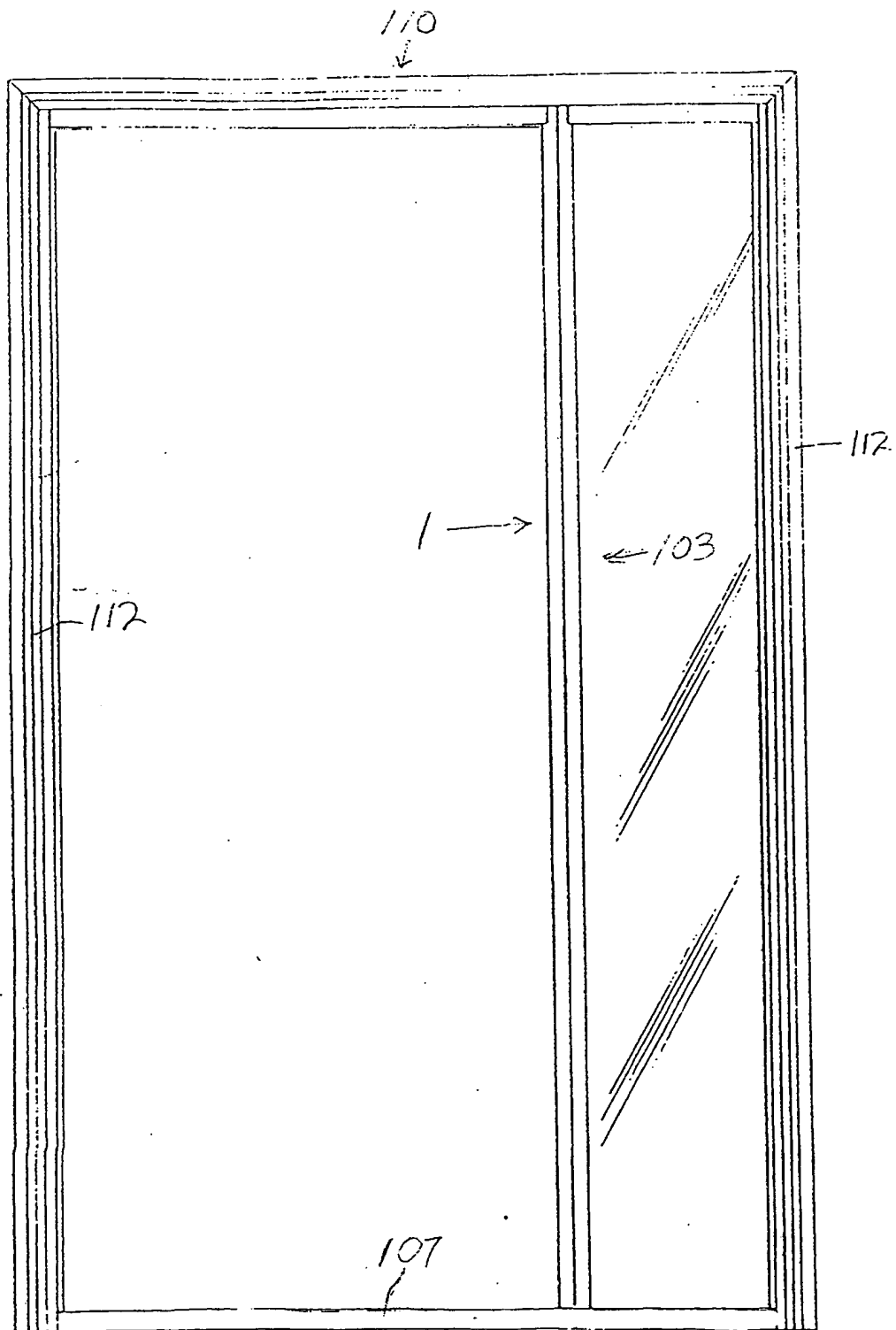


FIG 24